

DEPARTMENT OF THE ARMY TECHNICAL MANU

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OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL
SUPPORT AND DEPOT MAINTENANCE MANUAL

DRIER-MIXER BITUMINOUS-CONCRETE MATERIALS,
WHEEL MOUNTED; GED; 2 WHEEL, PNEUMATIC
TIRES: 3 TO 10 TON PER HR; McCONNAUGHAY
MODEL HTD-A-67; FSN 3895-832-6230

This copy is a reprint which includes current
pages from Changes 1 and 2.

BEFORE OPERATION

Lift and tie down mixer by trailer lifting and tiedown attachments only.

Do not use a lifting device with a capacity of less than 10,000 pounds to lift the trailer mounted mixer. Do not allow the unit to swing or sway while suspended.

When towing from flatcar or other shipping device make sure the ramp will support both vehicles. Never allow the mixer to roll freely down a ramp or other inclined surface.

Do not operate mixer unless the operating instructions have been thoroughly read and understood.

Do not fill asphalt tank before checking to see if any water or other foreign material has gotten into the tank. Water will cause the hot asphalt to foam which may seriously burn the operator.

DURING OPERATION

Do not operate the mixer in an enclosed area unless the exhaust gases are piped outside. Inhalation of exhaust fumes can result in serious illness or death.

Do not operate the burners without material in the pugmill or asphalt tank.

Do not operate the fuel pump without fuel in the fuel tank.

Do not operate the asphalt pump without liquefied asphalt or fuel oil in it.

Do not heat asphaltic materials above recommended temperatures.

Do not open asphalt tank lid while the burners are in operation.

Operate the mixer on firm ground.

Do not allow water or other foreign materials to get into asphalt tank.

Do not shut the mixer down for long periods without following normal shut down and clean out procedures. Failure to do so may freeze up the asphalt pump lines and pugmill.

Do not allow burners to run unless they are ignited.

Do not attempt to spin the engine with the starting crank.

Do not attempt to make adjustments or repairs while the mixer is in operation.

AFTER OPERATION

Allow for sufficient cooling after operation before performing service or maintenance to the mixer.

Release air pressure from brake system before working on the system.

CHANGE }
No. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 28 October 1969

**Operator, Organizational, Direct Support,
General Support and Depot Maintenance Manual**

**DRIER-MIXER, BITUMINOUS-CONCRETE MATERIALS; WHEEL MOUNTED; GED; 2-WHEEL,
PNEUMATIC TIRES: 3 TO 10 TON PER HR; McCONNAUGHAY MODEL HTD-A-67;
FSN 3895-832-6230**

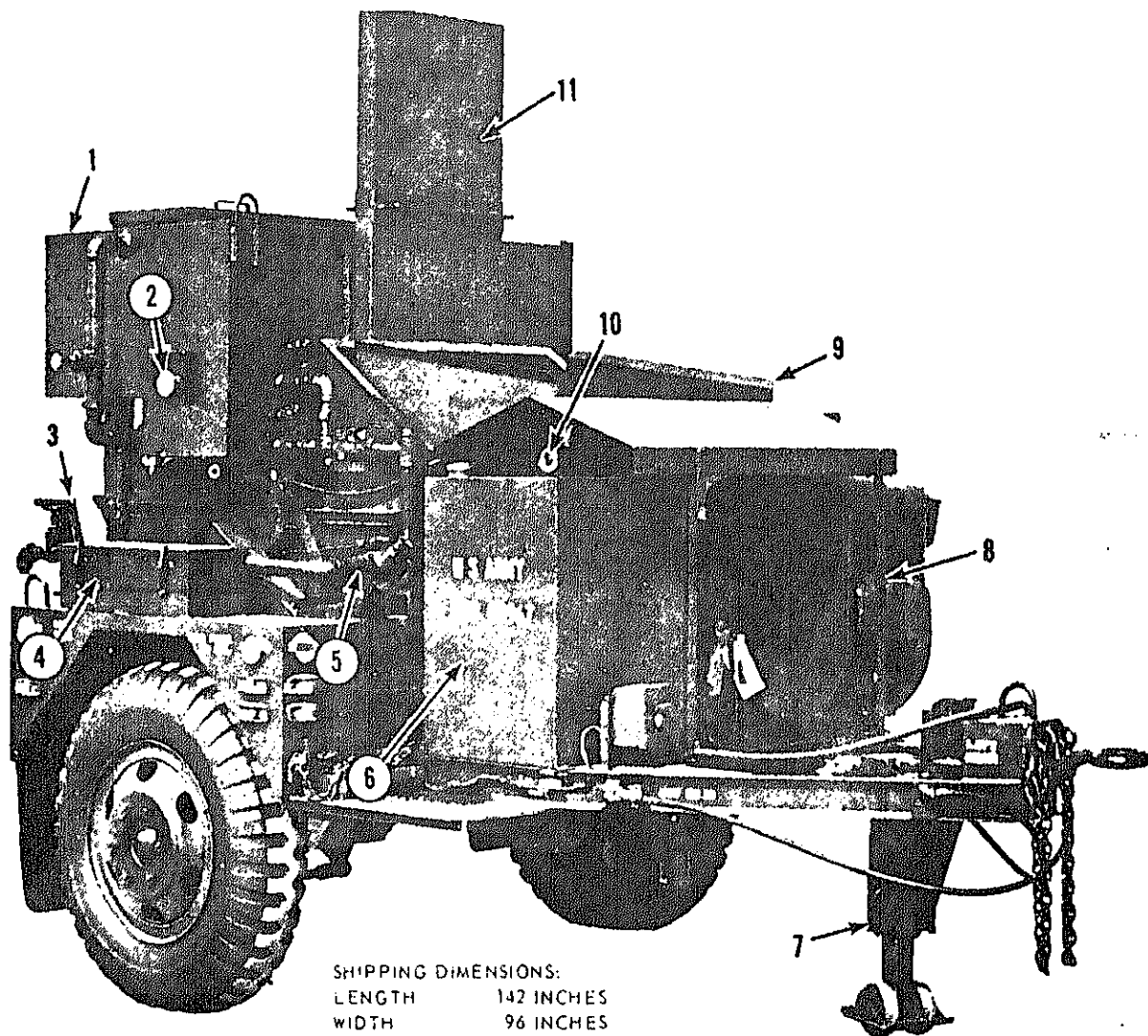
TM 5-3895-283-15, 5 July 1968, is changed as follows:

Safety Precautions. During Operation. After line 8, the following is added: "Disconnect from prime mover only when on level ground. The mixer has a tendency to tip backwards when operated on a slope. Be certain that the safety jack is positioned in the PARK position before mounting the

unit for inspection."

Page 1-1. Paragraph 1-3a. In line 5, "or portland cement" is added after the word "material".

Page 1-2. Figure 1-1 is superseded as follows:



SHIPPING DIMENSIONS:
 LENGTH 142 INCHES
 WIDTH 96 INCHES
 HEIGHT 94 INCHES
 WEIGHT 6,715 POUNDS
 CUBE 749

ME 3895-283-15/1-1

Key to figure 1-1

- 1 Asphalt tank
- 2 Thermometer
- 3 Discharge gate lever
- 4 Toolbox
- 5 Asphalt pump mounting group
- 6 Fuel oil tank
- 7 Landing leg
- 8 Engine
- 9 Charging hopper
- 10 Timer
- 11 Exhaust stack and support

Paragraph 1-4b(7). In line 5, "5210 pounds" is changed to read "6715 pounds."

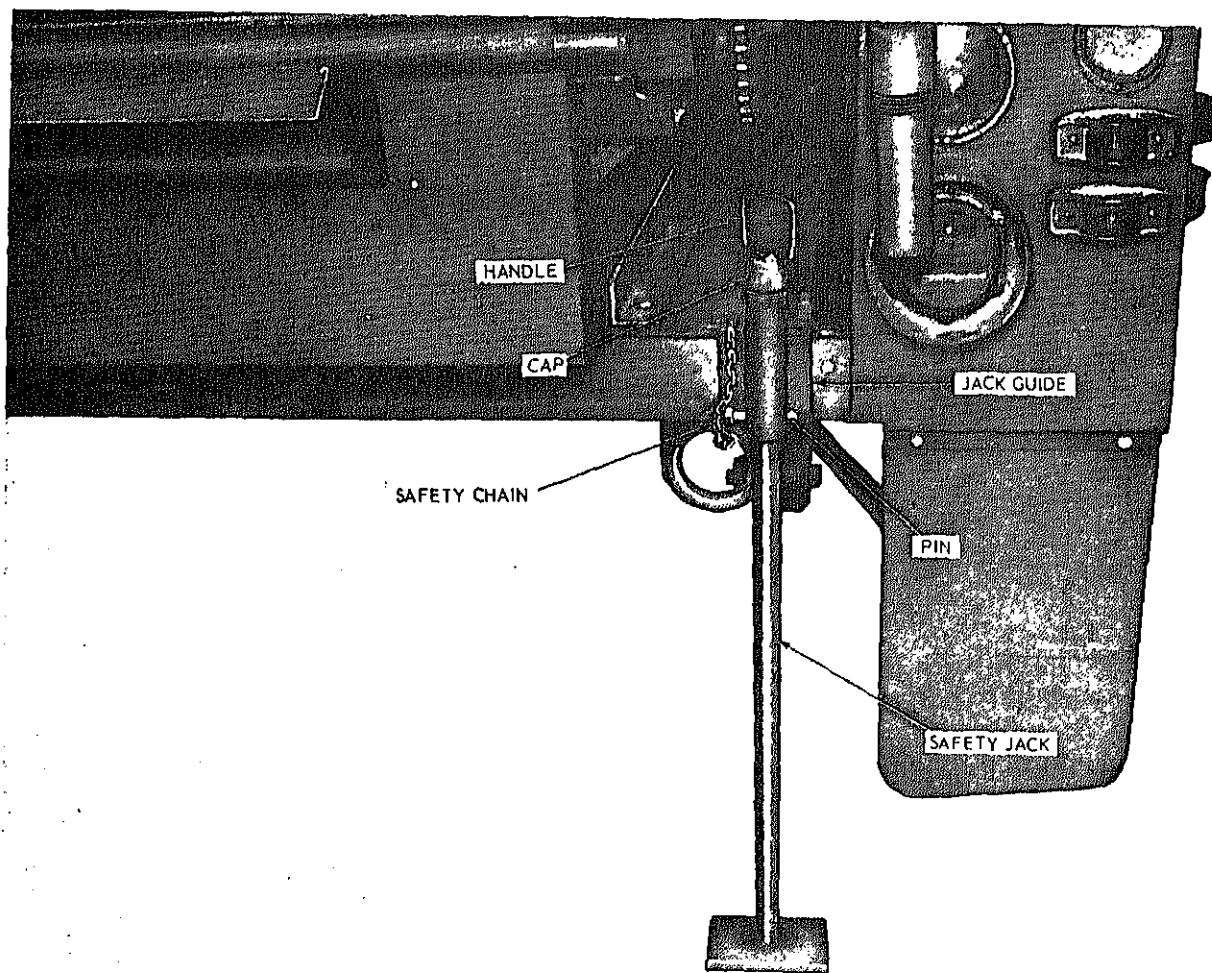
Page 2-1. Paragraph 2-5a. In line 5, the words "nearly level," are added after the word "firm."

The following CAUTION is added after subparagraph 2-5a:

CAUTION: Disconnect from prime mover only when on level ground and when

Page 2-1. Paragraph 2-5. Subparagraph c is added as follows:

c. When parked there is a risk of the trailer tipping backward when personnel are standing on the unit. For this reason, the rear safety jack is provided and must be installed in the PARK position when the worksite is reached. Refer to figures 2-1.1 and 2-1.2 for illustrations showing the safety jack in the PARK and TRAVEL positions.



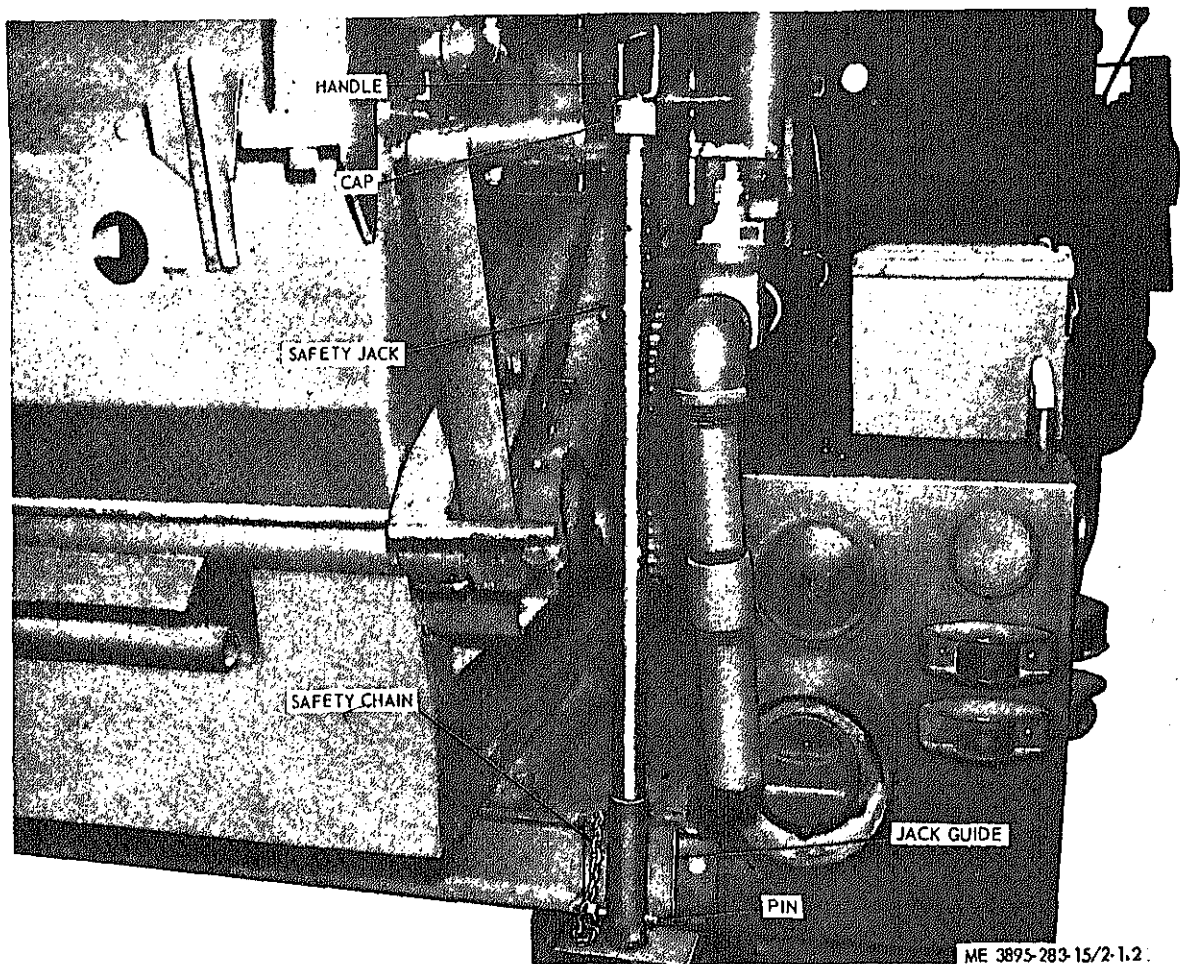


Figure 2-1.2. Safety jack in TRAVEL position.

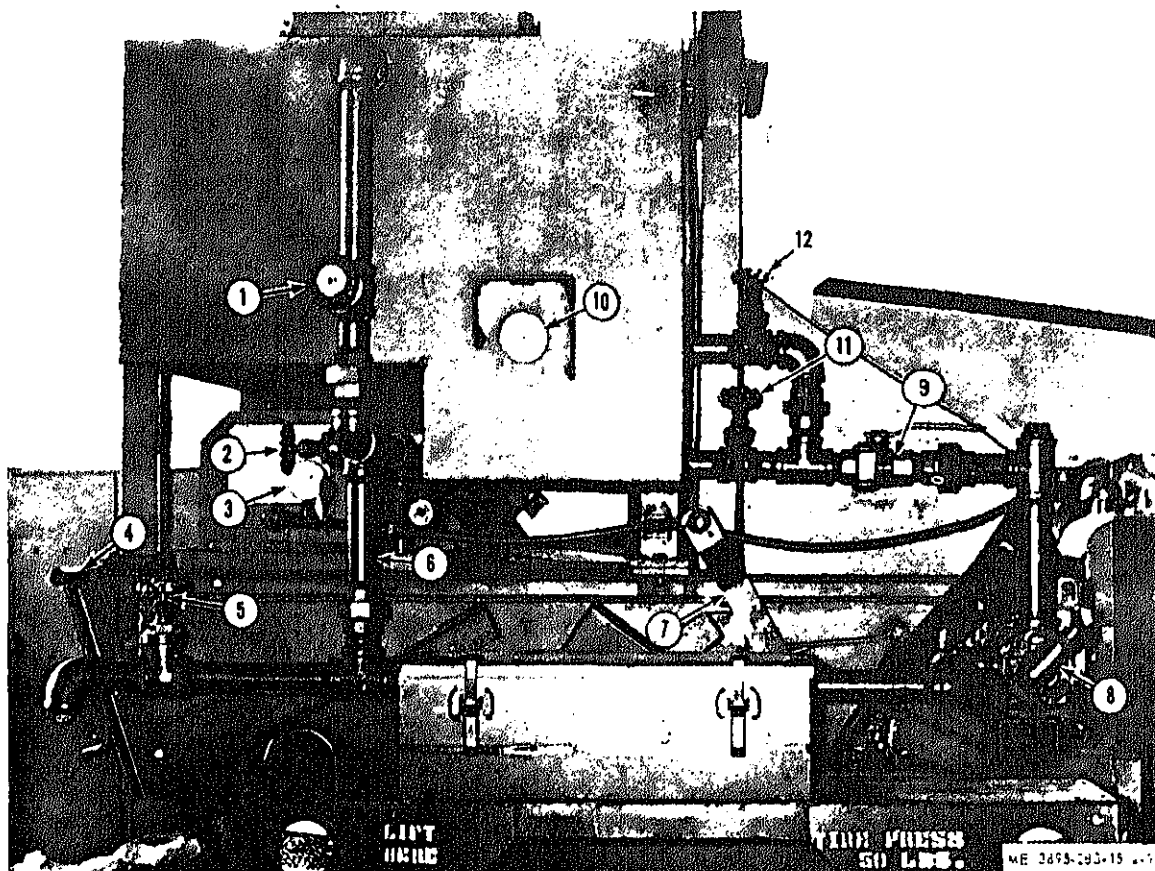
Page 2-2. Paragraph 2-6. The following is added immediately preceding paragraph 2-7:

"Hook up the intervehicular brake lines between the drier-mixer and the prime mover."

CAUTION: Operate the brakes on the prime mover to ascertain if the brakes on the drier-mixer are connected correctly and operating simultaneously in a like manner.

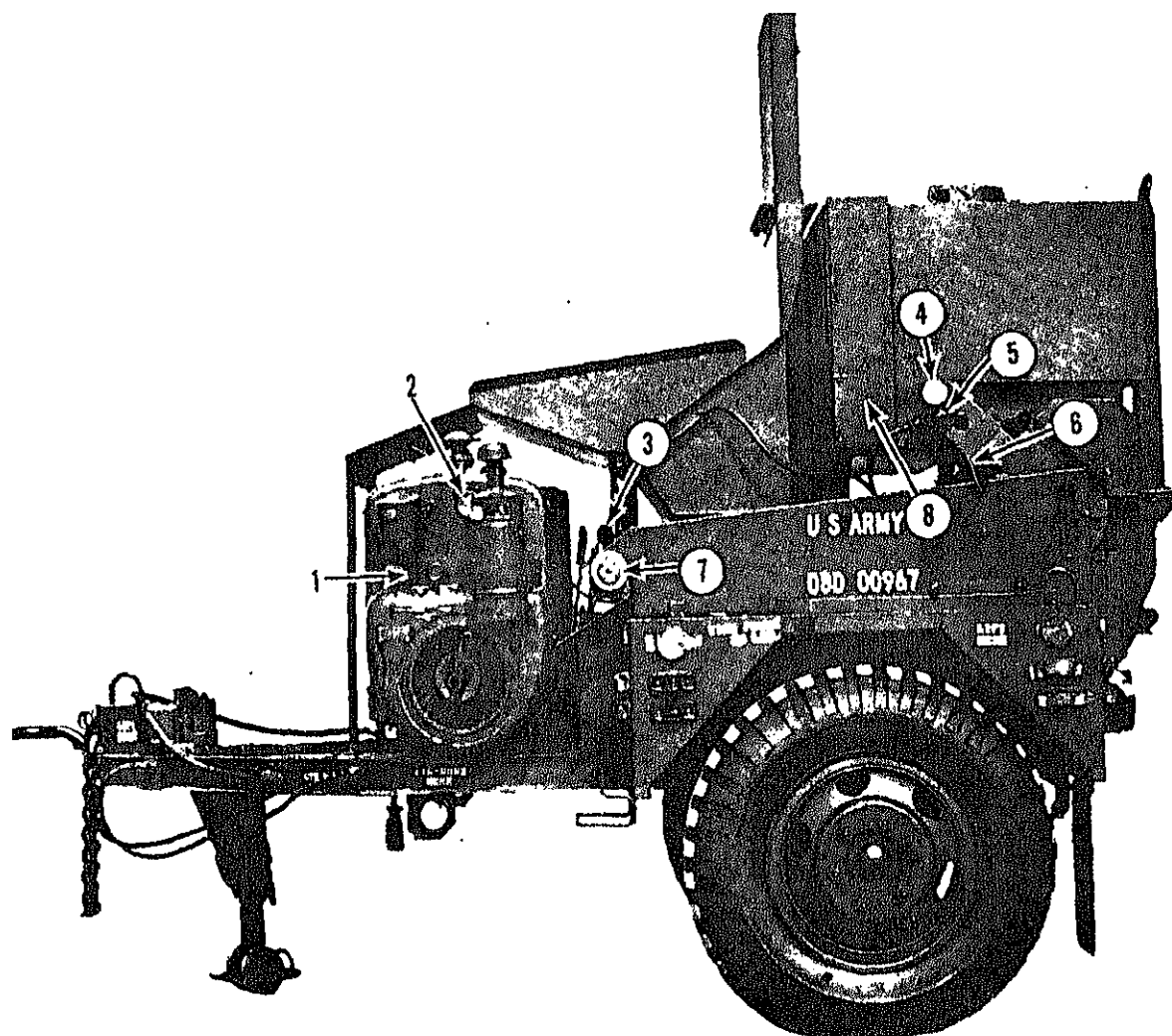
Page 2-4. Paragraph 2-9c. Subparagraph (9) is superseded as follows:

(9) *Ignition air control.* There is a damper located inside the blower housing which is normally open during operation. The damper is OPEN when the lever is DOWN (fully counterclockwise), and CLOSED when the lever is UP (fully clockwise). This damper is to be closed, manually, only during the ignition of the asphalt tank burner.



Key to figure 2-3 ③

- 1 Recirculation valve
- 2 Pugmill line valve
- 3 Pugmill burner gage
- 4 Discharge gate lever
- 5 Drain line valve
- 6 Pugmill burner strainer valve
- 7 Front gate (inlet) lever
- 8 Asphalt pump
- 9 Tank-to-pump line valve
- 10 Thermometer
- 11 Pump control drain valve
- 12 Pump supply valve



ME 3895-283-15/2-3 ④

Key to figure 2-3 ④

- 1 Governor control
- 2 Hourmeter tachometer
- 3 Filler cap
- 4 Asphalt tank burner gage
- 5 Asphalt tank burner control valve
- 6 Damper lever
- 7 Fuel oil pump
- 8 Flue cleaning and inspection access cover

TION following subparagraph (6) is superseded as follows:

CAUTION: Be sure the crank engages and disengages freely and grip the handle properly to avoid injury. Do not attempt to spin the engine with the starting crank. If the engine does not start on the first pull of the crank, re-engage crank and repeat the operation. Keep crank and shaft clean.

Paragraph 2-11c(4) is changed to read: "(4) Increase engine speed to approximately 1,800 rpm."

Page 2-9. Paragraph 2-11e is superseded as follows:

e. Drier-Mixer Starting and Operation.

(1) Load charging hopper with desired aggregate.

(2) Engage master clutch (fig. 2-3 ②) and light main burner (fig. 2-3 ③) following the steps in paragraph 2-11c.

(3) Open valves as required for recirculation as described in paragraph 2-11j.

Page 2-10. Paragraph 2-11g(1)(b). In line 3, the word "working" is added before "temperature." The following is added to subparagraph 2-11g(1)(b): "These temperatures will be reached more quickly by recirculation of the materials."

CAUTION: The materials must reach pumping temperature before they can be recirculated. Refer to paragraph 2-11j for positioning of valves for recirculation."

Paragraph 2-11g(2)(b). In line 3, the word "working" is added before "temperature."

Paragraph 2-11g(2). The following CAUTION is added after subparagraph (f):

CAUTION: Add cutback to mixing chamber immediately following addition of aggregate. Do not add cutback to heated aggregate."

Paragraph 2-11g(3)(b). In line 3, the

2 of the CAUTION, the words "water or" are rescinded.

In lines 2 and 3 of the last NOTE in paragraph, the word "asphalt" is changed to read "liquid" in both places.

The following NOTE is added after the last NOTE in the paragraph:

Note. When mixing concrete and pumping water from an outside source, i.e., tank or drum, connect one end of a hose to the asphalt pump (G, fig. 2-4) and place the other end in the tank of water. Close valves 1, 5, and 9 (fig. 2-3 ③). All remaining valves are normally open.

After paragraph 2-11i, add the following subparagraphs.

j. Positioning Valves for Recirculation. Refer to figure 2-3 ③ for the location of the valve and place valves in position for recirculation as follows:

- (1) Open recirculation valve (1).
- (2) Close pugmill line valve (2).
- (3) Close drain line valve (5).
- (4) Open tank-to-pump line valve (9).

k. Positioning Valves for Transferring Liquid From an Outside Source Into the Asphalt Tank.

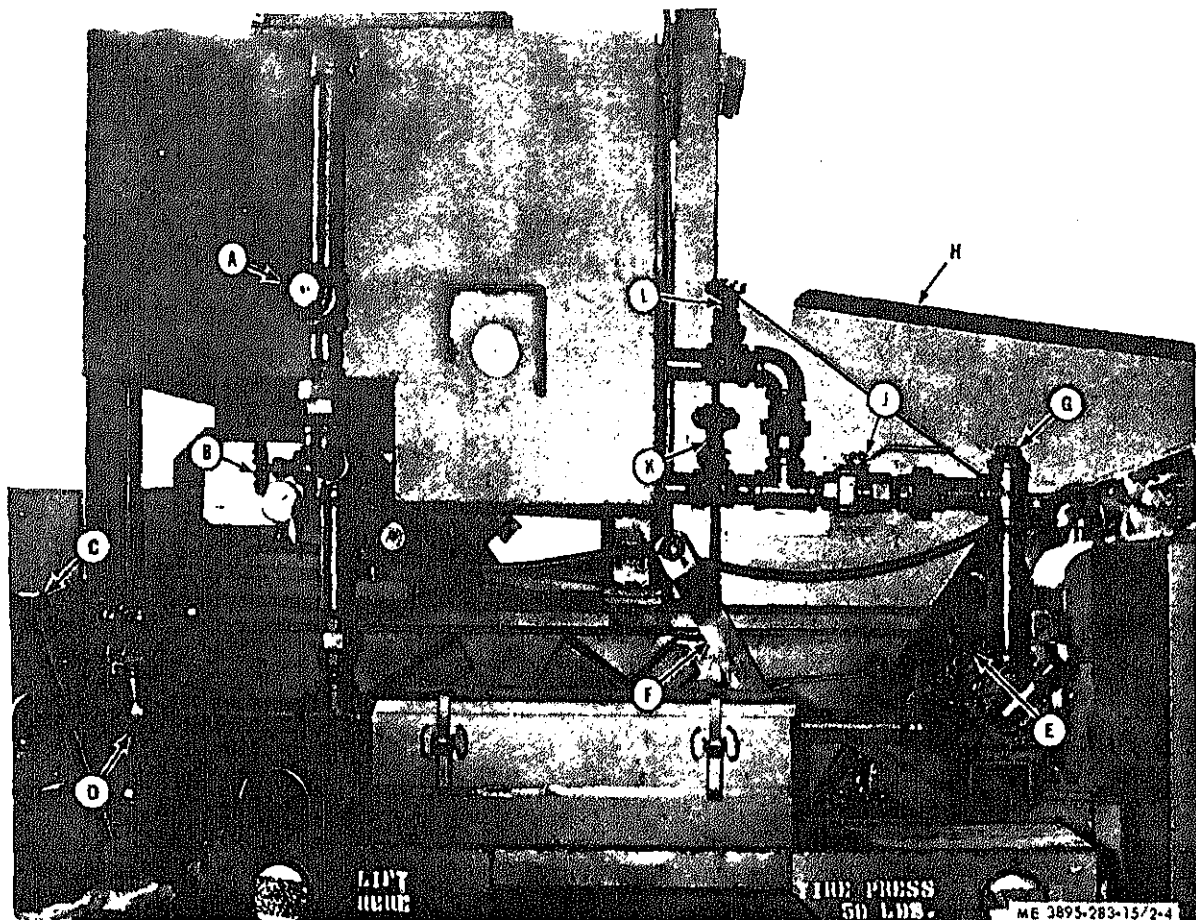
(1) Attach water supply hose to (G) (shown in fig. 2-4) and place other end in the container of liquid.

(2) Refer to figure 2-3 ③ for location of valves and place valves in position for pumping liquid into the tank as follows:

- (a) Open recirculation valve (1).
- (b) Close pugmill line valve (2).
- (c) Close drain line valve (5).
- (d) Close tank-to-pump line valve (9).

Page 2-11. Table 2-1. In column 3, the heading is changed to read "ASPHALT TANK WORKING TEMP."

The following is added after the note below the table: "For additional information on asphalt material and on temperatures, refer to TM 5-337 and TM 5-331D."



- Step 1 Check to see that valves (A) and (J) are closed.
- Step 2 Shut off burners, leaving drier-mixer running.
- Step 3 Fill charging hopper with aggregate.
- Step 4 Open front gate and allow aggregate to enter pugmill (lever F).
- Step 5 Remove plug (G).
- Step 6 Open valve (B).
- Step 7 Engage asphalt pump clutch lever (E) and pour fuel oil into opening (G); or attach one end of a hose to (G) and place the other end in a container of fuel oil. This allows fuel oil to be pumped through the system and into the pugmill (fig. 2-4.1).
- Step 8 Disengage asphalt pump clutch (lever at E), and fill line with fuel oil before replacing plug (G). This allows fuel oil to stand in the line and pump.
- Step 9 Discharge aggregate and oil mix in pugmill (lever C).
- Step 10 Shut down drier-mixer.

Note. Before starting next time, open valve (D) and drain fuel oil out of lines and pump.

Note. When cleaning the system after production of concrete, substitute water in place of the fuel oil as instructed in steps 7 and 9. After water has been drained, put a small amount of oil into the pump (G) to keep it from rusting.

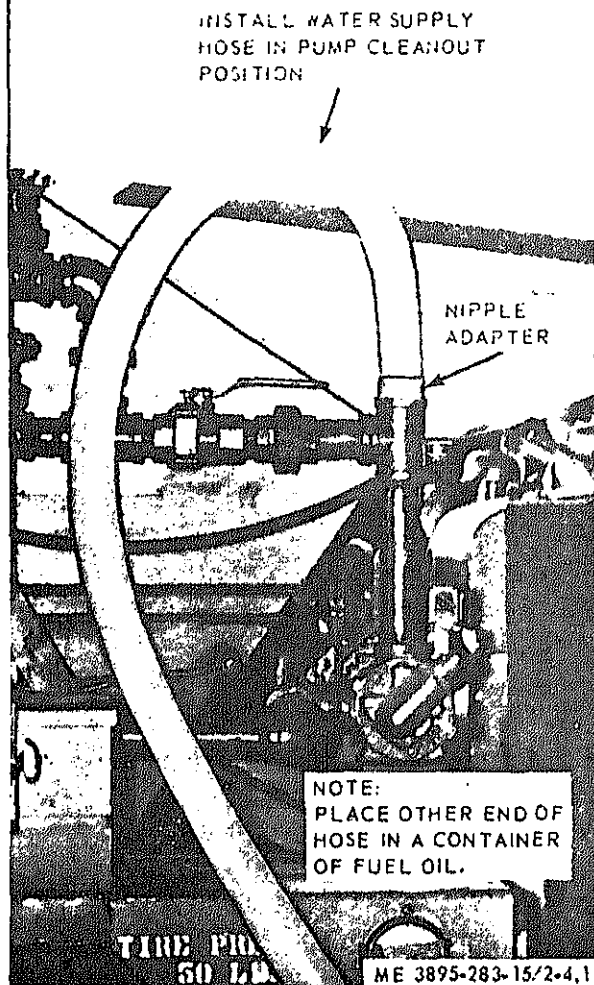


Figure 2-4.1.
Water supply hose in pump cleanout position.

Page 2-13. Paragraph 2-15 is superseded as follows:

2-15. Fire Extinguisher (dry chemical type)

a. *Description.* The dry-chemical type fire extinguisher is effective in areas where ambient temperature is -25°F and above. If winterized (pressured with nitrogen), the fire extinguisher may be used in temperatures

b. *Operation.* Remove the fire extinguisher from its location, lift the handle, press lever, and direct the powder at the base of the flame using a side-to-side sweeping motion.

c. *Maintenance.* Weigh the fire extinguisher every 6 months. Replace the extinguisher if the weight is less than 4-1/2 pounds or if the pressure is below 125 pounds. See TB 5-4200-200-10. The dry chemical extinguishers will be serviced at installation level through repair and utilities facilities, with the filling agent supplied by local procurement through Troop Supply channels.

Page 3-5. Item 17, in "Par Ref" column, "3-51" is added before "4-4D."

Page 3-7. Paragraph 3-10b. In line 1, the word "Lamps" is added after "Combination Service."

Page 3-8. Paragraph 3-12 is superseded as follows:

3-12. Fuel Oil Pump and Blower Belts Adjustment

Note. Location of belts is illustrated in figure 2-2B.

a. Remove mounting hardware and remove belt guards (fig. 3-25).

b. Test belt deflection with finger pressure midway between the pulleys. Proper deflection is about 1 inch. If deflection is greater than 1 inch, individual links can be removed from belt, as required, to increase the belt tension.

c. Install belt guards and secure with mounting hardware.

Page 3-8. Paragraph 3-13 is superseded as follows:

3-13. Chain Adjustment

a. *Main Drive Chain Adjustment.* Loosen the eight engine holddown bolts (fig. 3-10A) and slide the engine toward the front of the mixer to tighten chain tension or toward the rear to loosen tension. Chain is properly adjusted when deflection

mately 1/2 to 3/4 inches under finger pressure. When proper adjustment is attained, tighten the engine hold-down bolts.

b. Asphalt Pump Drive Chain. Loosen the idler screw (fig. 3-10B) and slide the sprocket to tighten chain. Deflection midway between sprockets should be approximately 1/2 inch. If chain is too tight in loosest adjustment of idler, adjust entire crossover shaft position by loosening hold-down bolts on frame.

c. Mixing Shaft Drive Chain. Loosen the idler screw (fig. 3-10C) and slide the sprocket to tighten chain. Deflection midway between sprockets should be approximately 1/2 inch.

Page 3-10. Paragraph 3-24. In line 3, "Sticky inlet valves" is changed to read "sticky intake valves."

Paragraph 3-25. Add the "probable cause" and "possible remedy" immediately before paragraph 3-26 as follows:

<i>Probable cause</i>	<i>Possible remedy</i>
Low fuel pressure due to loss of pump prime	Bleed pump at bleeder valve.
Supply or return line clogged or restricted	Remove restriction. <i>Note.</i> Return line pressure must not exceed 10 psi.
Fuel pump pressure incorrect	Adjust pressure to 120 psi.
Dirty or clogged fuel pump strainer	Clean or replace strainer screen.

Page 3-12. Paragraph 3-34a(6). "Four (4)" is changed to read "eight (8)."

Paragraph 3-34b(3). In line 1, "figure 3-10" is changed to read "paragraph 3-13."

Paragraph 3-36b. The words "heat deflectors" are changed to read "baffles" wherever they appear.

Page 3-14. Paragraph 3-39a(1). In line 2, "56" is changed to read "3-36."

as follows.

3-40. Upper Manifold

a. Removal. Remove the upper manifold as illustrated in figure 3-17.

b. Replacement.

(1) Install new gaskets and install the upper manifold as illustrated in figure 3-17.

(2) Torque upper manifold nuts to 14-18 foot-pounds.

Page 3-16. Paragraph 3-41a(5) is superseded and subparagraph (6) is added as follows:

(5) Remove carburetor mounting bolts.

(6) Remove lower manifold.

Paragraph 3-42a. Subparagraph (1) is rescinded. Renumber (2), (3), and (4) accordingly.

Page 3-18. Paragraph 3-44a(2) is superseded as follows:

(2) Remove muffler, canopy, and side cover (para 3-35 and 3-36).

Paragraph 3-44a(3). Immediately after line 2, the following is added: "Remove line from fuel pump to carburetor."

Paragraph 3-44b(3) is superseded as follows:

(3) Replace side cover, canopy, and muffler (para 3-35 and 3-36).

Paragraph 3-45a. Immediately after subparagraph (3), the following is added:

(4) Remove cylinder baffle screws (3). (Renumber (4) and (5) accordingly.)

Page 3-19. Paragraph 3-47.1 and figure 3-25.1 are added after paragraph 3-47.

3-47.1 Fuel Tank

a. Removal. Remove the fuel tank as illustrated in figure 3-25.1.

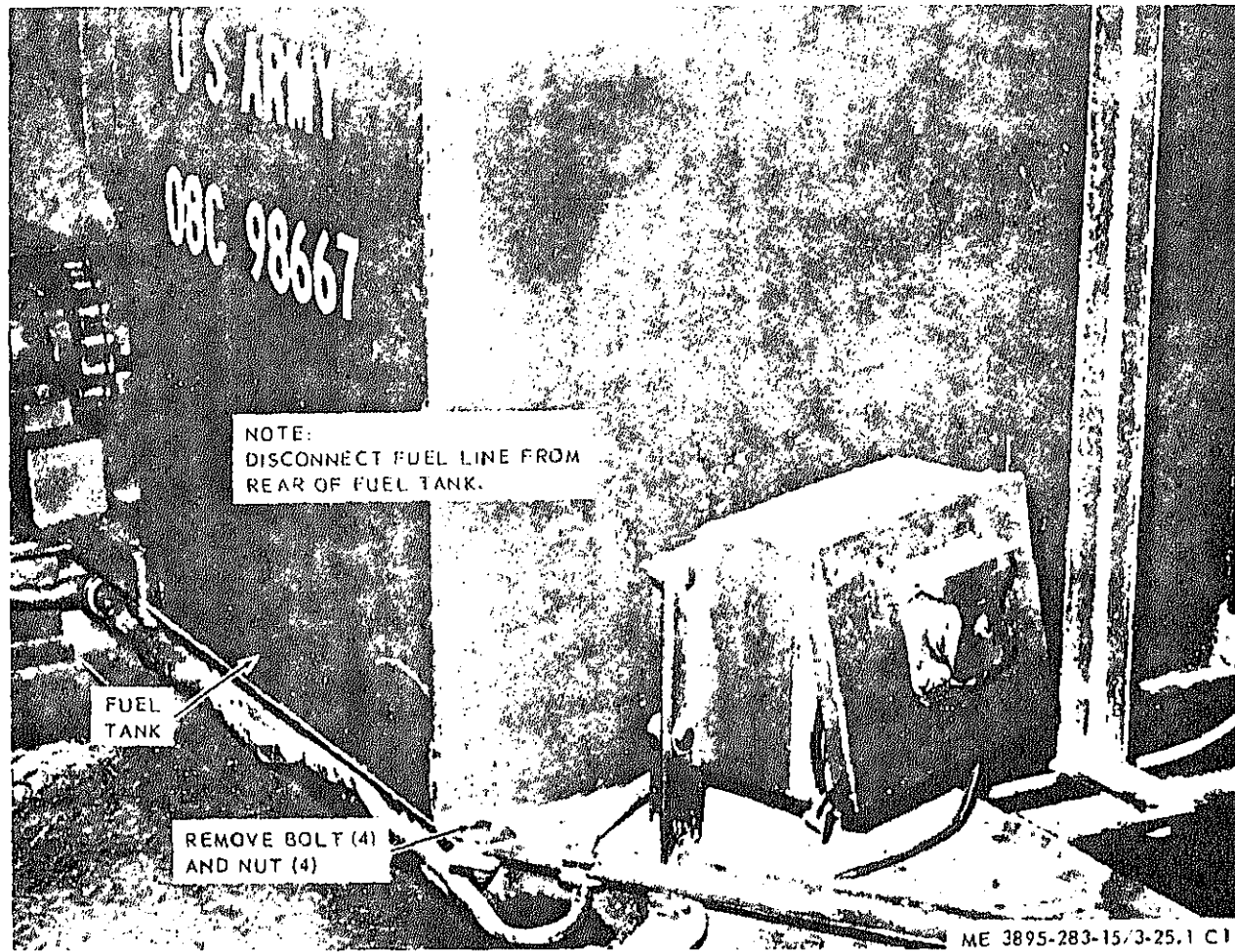


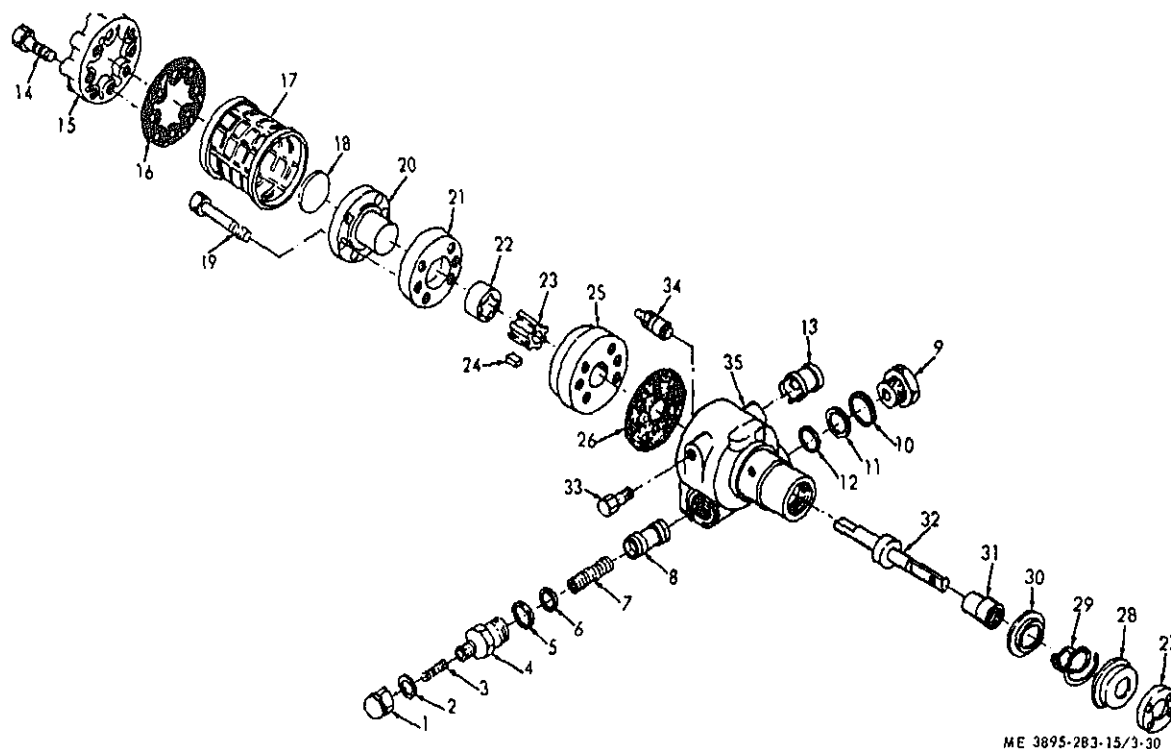
Figure 3-25.1. Fuel tank, removal and installation.

b. Installation. Install fuel tank as illustrated in figure 3-25.1.

Page 3-20. Paragraph 3-49. The following sentence is added to subparagraph *b.*

as follows: "Remove end cover screws (8); remove, inspect, and clean screen, if needed."

Page 3-21. Figure 3-29. Figure is turned



ME 3895-283-15/3-30

Key to figure 3-30

- | | |
|--------------------|--------------------|
| 1 Nut | 19 Bolt |
| 2 Gasket | 20 Endplate, front |
| 3 Adjusting screw | 21 Housing |
| 4 Plug | 22 Gear, outer |
| 5 Gasket | 23 Gear, inner |
| 6 Seat | 24 Key, shaft |
| 7 Spring | 25 Endplate, rear |
| 8 Piston | 26 Gasket |
| 9 Plug | 27 Nut, housing |
| 10 Gasket | 28 Washer, seal |
| 11 Spring washer | 29 Spring, seal |
| 12 O-ring, piston | 30 Diaphragm |
| 13 Sleeve, piston | 31 Bushing |
| 14 Screw | 32 Shaft assembly |
| 15 Cover | 33 Plug |
| 16 Gasket | 34 Bleeder, screw |
| 17 Strainer | 35 Body, pump |
| 18 Washer, antirun | |

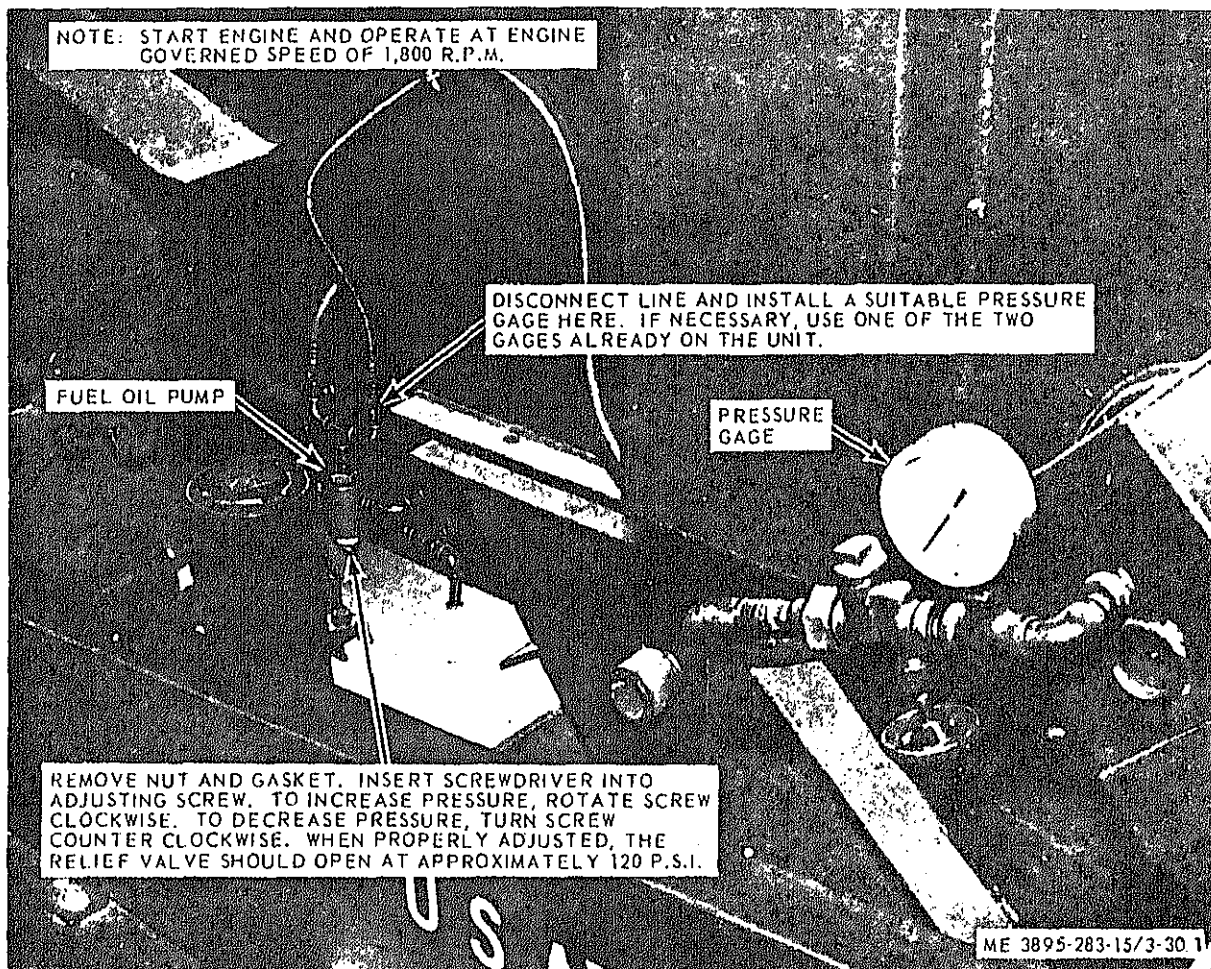


Figure 3-30.1. Fuel oil pump pressure adjustment.

Page 3-24. Paragraph 3-55a(2). Immediately after subparagraph (a), a new subparagraph (b) is added as follows: "(b) Disconnect union above elbow on recirculation pipe." Renumber subparagraph (b), (c), and (d) accordingly.

Pages 3-24 and 3-25. Paragraph 3-56 is rescinded.

Page 3-29. Paragraph 3-61.1 and figure 3-40 are added after paragraph 3-61 as follows:

3-61.1. Brake Chamber Air Filter Service

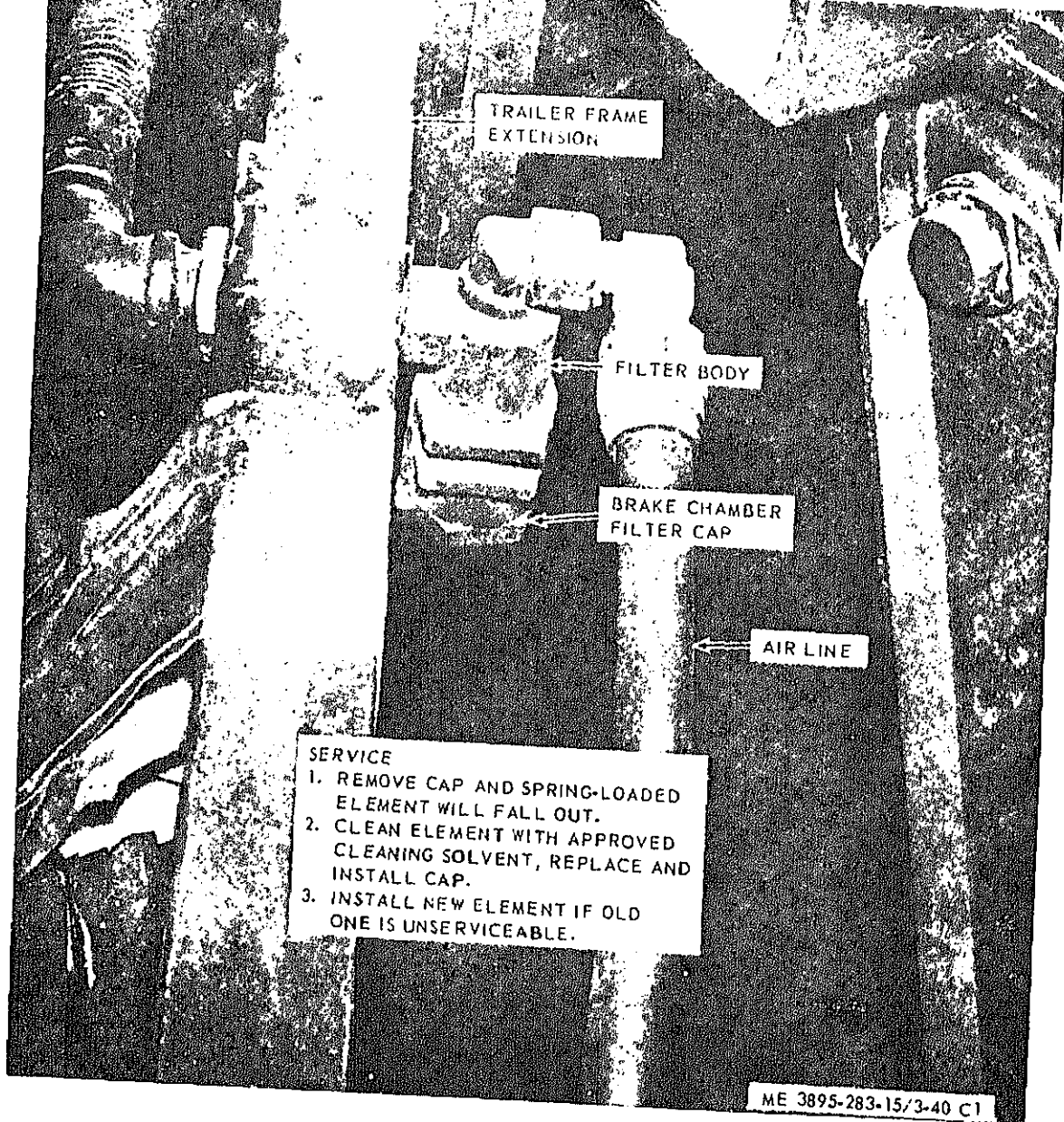


Figure 3-40. Brake chamber air filter service.

Page 3-30. Paragraph 3-67 is added as follows:

3-67. Springs

a. Removal.

(1) Place jack under trailer body frame and raise one wheel just off ground. Block other side wheel.

(2) Remove front and rear spring shackle bolts.

(3) Remove the H-shock absorber.

(4) Remove other spring in the same manner.

b. Cleaning, Inspection and Repair.

(1) Clean with approved cleaning solvent.

(2) Inspect for missing hardware and damaged leaves.

(3) Replace a damaged leaf.

(2) Install front and rear spring shackle bolts.

(3) Lower trailer and remove jacks.

(4) Install other spring in the same manner.

Page 5-2. Paragraph 5-17 is added as follows:

5-17. Pugmill Liner

a. Removal.

(1) Remove pugmill paddles (para 3-55).

the liner, and slide the liner out as shown in figure 3-11.

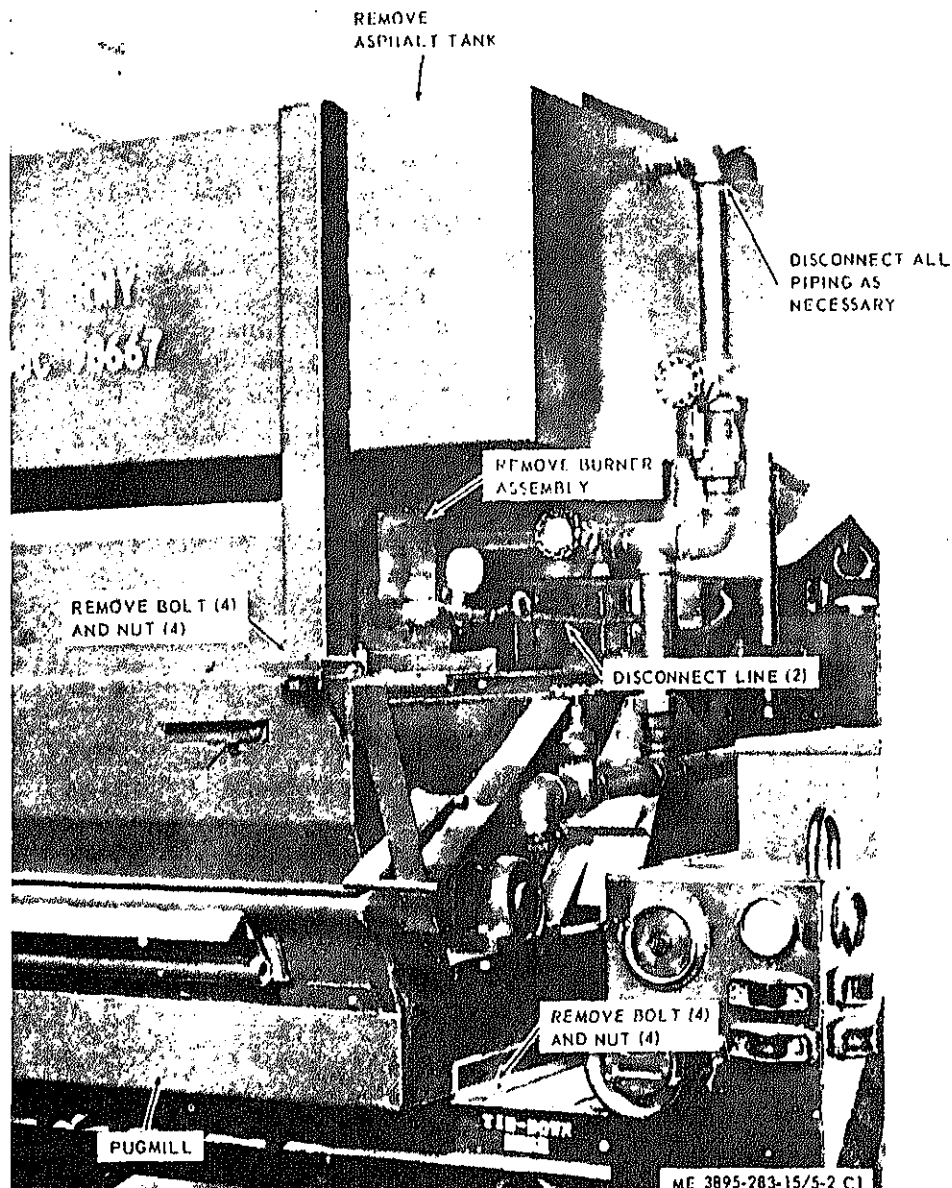
b. Installation.

(1) Install liner and secure with end screws.

(2) Install pugmill paddles (para 3-55). Paragraph 5-18 and figure 5-2 are added as follows:

5-18. Pugmill

a. Removal. Remove the pugmill assembly as illustrated in figure 5-2.



Page 6-1. Paragraph 6-7a is superseded as follows:

a. Removal.

(1) Loosen engine mounting bolts and remove drive belt cover and belt (para 3-47).

(2) Remove fuel pump and blower drive pulley (para 3-47).

(3) After flywheel screen has been removed, drive out the starting crankpin in the crankshaft and remove the flywheel nut and washer (fig. 6-1).

(4) The flywheel is mounted to a taper on the crankshaft. Hold flywheel fins firmly and pull outward while striking the end of the crankshaft with a babbitt hammer.

Pages B-1 and B-2. Paragraph B-3 is superseded as follows:

B-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of basic issue items, section II.

a. Source, Maintenance, and Recoverability Codes (SMR), Column (1).

(1) Source code, indicates the selection status and source for the listed item. Source code is:

Code	Explanation
P	Repair parts which are stocked in or supplied from the GSA/DSA or Army supply system, and authorized for use at the indicated maintenance categories.

to install the listed item. The maintenance level code is:

Code	Explanation
C	Operator/crew

(3) Recoverability code, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable.

b. Federal Stock Number, Column (2). This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description, Column (3). This column indicates the Federal item name and any additional description of the item required.

d. Unit of Measure (U/M, Column (4). A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based; e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit, Column (5). This column indicates the quantity of the item used in the assembly group.

f. Quantity Furnished With Equipment, Column (6). This column indicates the quantity of an item furnished with the equipment.

g. Illustration, Column (7). Not applicable.

Page B-4. Section II, Basic Issue Items List, is superseded as follows:

(1) SMR Code	(2) Federal stock number	(3) Description	(4) Unit of meas	(5) Qty inc in unit	(6) Qty turn with equip	(7) Illustration	
						(a) Fig No.	(b) Item No.
		BASIC ISSUE ITEMS, MANUFACTURER OR DEPOT INSTALLED					
PC	7510-889-3494	BINDER, Looseleaf	EA	1	1		
PC	7520-559-9618	CASE, Operation and Maintenance Manuals	EA	1	1		
PC		DA Lubrication Order LO 5-3895-283-12	EA	1	1		
PC		DA Technical Manual TM 5-3895-283-15	EA	1	1		
PC	2990-906-7920	CRANK, Hand	EA	1	1		
PC	4210-889-2221	EXTINGUISHER, Fire, 2-1/2 lb. Fed. Spec. O-E95	EA	1	1		
PC	5120-264-3796	WRENCH, Adjustable	EA	1	1		
PC	5120-277-1461	WRENCH, Pipe	EA	1	1		

Pages C-2 through C-5. Section II,
Maintenance Allocation Chart, is super-
seded as follows:

Section II. MAINTENANCE ALLOCATION CHART

(1) Group no.	(2) Functional group	(3) Maintenance functions											(4) Tools and equipment	(5) Remarks
		A	B	C	D	E	F	G	H	I	J	K		
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild		
01	ENGINE ASSY													
0100	Engine Assy — Gas Air Cooled	O	O	O	—	—	—	—	O	F	H	—	—	A
0101	Crankcase, Block Head, cyl	—	—	—	—	—	—	—	H	H	—	—	—	
0102	Crankshaft Assy Bearings, seals	—	—	—	—	—	—	—	O	O	—	—	—	B
0103	Flywheel Assy Flywheel	H	—	—	—	—	—	—	H	H	—	—	—	
0104	Pistons, Connecting Rods Pistons, rings, pins Rods, connecting	F	—	—	—	—	—	—	F	—	—	—	—	
0105	Valves	—	—	—	—	H	—	—	H	H	—	—	—	

(1) Group No.	(2) Functional group	(3) Maintenance functions										(4) Tools and equipment	
		A	B	C	D	E	F	G	H	I	J		K
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul		Rebuild
0106	Camshaft	H	-	-	-	-	-	-	H	-	-	-	-
	Camshaft bearings	H	-	-	-	-	-	-	H	-	-	-	
	Plunger springs	F	-	-	-	-	-	-	F	-	-	-	
	Tuning gears, covers	F	-	-	-	-	-	-	F	-	-	-	
	Engine Lubrication System	-	-	-	-	-	-	-	-	-	-	-	
	Pump, oil	-	-	-	-	-	-	-	F	F	-	-	
	Filters, oil	C	-	C	-	-	-	-	O	-	-	-	
	Filter	-	-	O	-	-	-	-	O	-	-	-	
	Crankcase ventilation	-	-	-	-	-	-	-	-	-	-	-	
	Cap, oil filler	C	-	O	-	-	-	-	O	-	-	-	
0108	Tube and screen filler	-	-	C	-	-	-	-	O	-	-	-	-
	Oil pan, lines, level gage	O	-	-	-	-	-	-	F	-	-	-	
	Pan, oil	C	-	-	-	-	-	-	O	-	-	-	
	Lines, fittings	-	-	C	-	-	-	-	O	-	-	-	
	Dipstick	-	-	-	-	-	-	-	O	-	-	-	
	Manifolds	C	-	-	-	-	-	-	O	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	
02	CLUTCH	-	-	-	-	-	-	-	-	-	-	-	
0200	Clutch Assy, Friction	-	-	O	O	-	-	-	F	F	H	-	-
	Clutch discs, plates	-	-	-	-	-	-	-	F	F	-	-	
0202	Clutch Release Mechanism	-	-	-	-	-	-	-	-	-	-	-	-
	Sleeve assy	F	-	-	-	-	-	-	F	F	-	-	
	Bearings	F	-	-	-	-	-	-	F	F	-	-	
03	FUEL SYSTEM	-	-	-	-	-	-	-	-	-	-	-	
0301	Carburetor	C	-	-	O	-	-	-	O	-	-	-	-
0302	Fuel Pump, Gasoline	C	-	-	-	-	-	-	O	-	-	-	
0304	Air Cleaner, Hoses	-	-	O	-	-	-	-	O	-	-	-	
0306	Tanks, Lines, Fittings	-	-	-	-	-	-	-	-	-	-	-	
	Tank, fuel	-	-	O	-	-	-	-	O	-	-	-	
	Line, fuel	C	-	-	-	-	-	-	O	-	-	-	
	Cap, fuel tank	-	-	C	-	-	-	-	O	-	-	-	
0308	Engine Speed Governor	-	-	-	-	-	-	-	O	F	-	-	
	Governor controls	-	-	-	O	-	-	-	O	O	-	-	
0309	Fuel Filters	-	-	O	-	-	-	-	O	-	-	-	
0312	Accelerator, Throttle, or Choke Controls	C	-	-	-	-	-	-	O	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	
04	EXHAUST SYSTEM	-	-	-	-	-	-	-	-	-	-	-	
	Muffler, Pipes, Flanges	C	-	-	-	-	-	-	O	-	-	-	
05	COOLING SYSTEM	-	-	-	-	-	-	-	-	-	-	-	
0502	Cooling, Deflectors, Air Ducts, Shrouds	O	-	-	-	-	-	-	O	-	-	-	
06	ELECTRICAL SYSTEM (ENGINE)	-	-	-	-	-	-	-	-	-	-	-	
0605	Magneto	-	O	O	O	-	-	-	O	F	-	-	
	Wiring, Spark Plugs	-	-	-	-	-	-	-	-	-	-	-	

[illegible]

Group no.	Functional group	Inspect	A	B	C	D	E	F	G	H	I	J	K	Tools and equipment
		Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild			
1808	Stowage Racks, Toolboxes	-	-	-	-	-	-	-	O	O				
22	ACCESSORY ITEMS													
2202	Reflectors, Timer	C	-	-	-	-	-	-	O					
2210	Data Plates, Instruction Plates	O	-	-	-	-	-	-	F					
47	GAGES (NON-ELECTRICAL WEIGH- ING, MEASURING DEVICES)													
4701	Tachometer, Hourmeter	C	-	-	-	-	-	-	O					
4702	Oil Pressure Gage	C	-	-	-	-	-	-	O					
	Thermometer, Counter	C	-	-	-	-	-	-	O					
55	PUMPS (EXCLUDE ENGINE PUMPS)													
5500	Pump Assembly													
	Pump, asphalt	-	-	-	-	-	-	-	O	O				
5501	Impeller, Rotor, Diaphragm	-	-	-	-	-	-	-	O	O				
5507	Pump Drive	-	-	-	O	-	-	-	O					
	Clutch Assy	-	-	-	O	-	-	-	O	O				
60	HEATING UNITS, BURNERS													
6604	Fuel System													
	Fuel pumps	-	-	O	O	-	-	-	O	F				
6005	Burners													
	Burner, asphalt tank	-	-	O	-	-	-	-	O	F				
	Burner, pugmill	C	-	-	-	-	-	-	F	F				
	Fuel Strainers, Valves	O	-	O	-	-	-	-	O					
	Lines, Fittings	-	-	O	-	-	-	-	O	O				
6007	Fuel Tank, Caps	-	-	O	-	-	-	-	O	O				
6008	Blower													
	Blower assy	-	-	O	-	-	-	-	O	F				
	Belt, blower drive	C	-	-	O	-	-	-	O					
6010	Exhaust System													
	Exhaust stack, upper	-	-	-	-	-	-	-	O	O				
73	CONCRETE AND ASPHALT EQUIP- MENT (MIXERS-DRIERS)													
7305	Countershafts, Attaching													
	Parts, Gears	-	-	-	-	-	-	-	F	F				
	Main drive chains and sprockets	-	-	O	-	-	-	-	O	O				
	Tighteners, chain	-	-	O	-	-	-	-	O	O				
	Guard housing, covers	-	-	-	-	-	-	-	O					
	Chain guards	C	-	-	-	-	-	-	O					
7306	Pugmill													
	Paddles, pugmill	-	-	-	-	-	-	-	O					
	Liners, shafts, bearings	C	-	-	-	-	-	-	F	F				
7318	Tanks, Valves, Hoses, Lines,													
	Fittings													
	Tank, asphalt	C	-	C	-	-	-	-	F					
	Cap, lid	-	-	C	-	-	-	-	O					
	Valves, lines, fittings	C	-	-	-	-	-	-	O					

Group no.	Functional group	Maintenance functions											Tools and equipment	Remarks
		A Inspect	B Test	C Service	D Adjust	E Align	F Calibrate	G Install	H Replace	I Repair	J Overhaul	K Rebuild		
76	FIREFIGHTING EQUIPMENT Fire Extinguishers	--	--	O	--	--	--	--	O	--	--	--		

Page C-6. Section IV, Maintenance Allocation Chart. Line 4 is changed to read as follows:

D — 1 Repair with kit.

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-25, Section II, (qty rqr block No. 382) organizational maintenance requirements for Drier-Mixer, Bituminous.

Change }
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 11 September 1973

**Operator's Organizational, Direct Support,
General Support, and Depot Maintenance Manual
DRIER-MIXER, BITUMINOUS-CONCRETE MATERIALS; WHEEL MOUNTED; GED;
2-WHEEL, PNEUMATIC TIRES: 3- to 10-TON PER HR; MCCONNAUGHAY MODEL
HTD-A-67; FSN 3895-832-6230**

TM 5-3895-238-15, 5 July 1968, is changed as follows:

Page ii. Appendix B title is changed as follows:

Basic Issue Item List and Items Troop Installed or Authorized List

Page 1-1. Paragraph 1-1d is superseded as follows:

d. The reporting of errors, omissions and recommendations for improving this publication by the individual user is encouraged. Reports

should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120.

Page 2-1. After paragraph 2-3b add:

c. For Maintenance and Operating supplies see table 2-0.

Table 2-0. Maintenance and Operating Supplies

(1) Component application	(2) Federal stock number	(3) Description	(4) Quantity required for initial operation	(5) Quantity required for operation	(6) Notes
0101 CRANKCASE.	9150-265-9435 (2) 9150-265-9428 (2) 9150-242-7603 (2)	LUBRICATING OIL: 5-gal pail as follows: OE-30 OE-10 OES	5 qt 5 qt 5 qt	(3) (3) (3)	(1) Includes quantity of oil to fill engine oil sump as follows: 4 qt Crankcase 1 qt Oil filter (2) See C9100-IL for additional data and requisitioning procedures. (3) See current LO for application and replenishment intervals. (4) Use oil as prescribed above. (5) Tank capacity (6) Average fuel consumption 1.8 gal per hour of continuous operation (7) Maximum fuel consumption for both burners is per hour of continuous operation.
0200-CLUTCH HOUSING. 0304-AIR CLEANER. 0306-FUEL TANK.	9130-161-1818 9150-252-6375 9140-286-5294	LUBRICATING OIL: (4) LUBRICATING OIL: (4) FUEL GASOLINE: Automotive, combat 91A. HYDRAULIC FLUID, 1-Gal can, HBA. FUEL OIL, DIESEL: DI-2.	1-3/4 qt 1 qt 17 (5) 3/4 qt 60 gal	(3) (3) 14.4 (6) (3) (7)	
0400-BRAKE MASTER CYLINDER 0007-FUEL TANK.		GREASE AUTOMOTIVE AND ARTILLERY: 5-Lb can as follows: GAA GH	5 lb 5 lb	(3) (3)	

APPENDIX B

BASIC ISSUE ITEM LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists basic issue items and items troop installed or authorized which accompany the drier-mixer and required by the crew/operator for operation, installation, or operator's maintenance.

B-2. General

This basic issue items, items troop installed or authorized list is divided into the following sections:

a. *Basic Issue Items List—Section II.* A list, in alphabetical sequence, of items which are furnished with and which must be turned in with the end item.

b. *Items Troop Installed or Authorized List—Section III.* A list, in alphabetical sequence, of items which, at the discretion of the unit commander, may accompany the end item, but are not subject to be turned in with the end item.

B-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of basic issue items, section II, and items troop installed or authorized, section III.

a. *Source, Maintenance, and Recoverability Code(s) (SMR):*

(1) The source code indicates the source for the listed item. Source codes are:

Code	Explanation
P	Repair parts, special tools, and test equipment supplied from GSA/DSA or the Army supply system and authorized for use at indicated maintenance levels.
P2	Repair parts, special tools, and test equipment which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.

(2) The maintenance code indicates the lowest level of maintenance authorized to install the listed

Code	Explanation
C	Crew/operator

(3) The recoverability code indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are nonrecoverable. Recoverability codes are:

Code	Explanation
R	Applied to repair parts (assemblies and components), special tools, and test equipment which are considered economically repairable at direct support and general support maintenance levels.
S	Repair parts, special tools, test equipment, and assemblies which are economically repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis.

b. *Federal Stock Number.* This column indicates the Federal stock number assigned to the item which will be used for requisitioning purposes.

c. *Description.* This column indicates the Federal item name and any additional description of the item required.

d. *Unit of Measure (U/M).* A 2-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based; e.g., ft, ea, pr; etc.

e. *Quantity Furnished with Equipment (BILL Only).* This column indicates the quantity of an item furnished with the equipment.

f. *Quantity Authorized (Items Troop Installed or Authorized Only).* This column indicates the quantity of the item authorized to be used with the equipment.

g. *Illustration (BILL Only).* This column is divided as follows:

(1) *Figure Number.* This column indicates the figure number of the illustration in which the item is shown.

(2) *Item Number.* This column indicates the callout number used to reference the item in

(1) SMR code	(2) Federal stock number	(3) Description	Unit of meas	Qty furn with equip	(a) fig no.
--------------------	--------------------------------	--------------------	--------------------	------------------------------	-------------------

PC	2990-906-7920	CRANK, HAND	ea	1	
----	---------------	-------------	----	---	--

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR code	(2) Federal stock No	(3) Description Ref No & Mfr code	Usable on code	(4) Unit of meas
	4210-889-2221 5120-264-3796 5120-277-1461	EXTINGUISHER, FIRE WRENCH, ADJUSTABLE WRENCH, PIPE		ea ea ea

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25B (qty rqr block No. 382) Organizational Maintenance Requirements for Drier-Mixer, Bituminous Concrete Material.

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL
 SUPPORT AND DEPOT MAINTENANCE MANUAL

DRIER-MIXER BITUMINOUS-CONCRETE MATERIALS,
 WHEEL MOUNTED; GED; 2 WHEEL, PNEUMATIC
 TIRES; 3 TO 10 TON PER HR; McCONNAUGHAY
 MODEL HTD-A-67; FSN 3895-832-6230

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. These instructions are published for use by personnel to whom the McConnaughay Model HTD-A-67 Drier-Mixer is issued. Chapters 1 through 3 provide information on operation, preventive maintenance services and organizational maintenance of equipment, accessories, components and attachments. Chapters 4, 5, 6 and 7 provide information for direct and general support and depot maintenance. Also included are descriptions of main units and their functions in relationship to other components.

b. Appendix A contains a list of publications applicable to this manual. Appendix B contains the list of basic issue items authorized the operator of this equipment and the list of maintenance and operating supplies required for initial operation. Appendix C contains the maintenance allocation chart. Organizational, direct and general, support and depot maintenance repair parts and special tools are listed in TM 5-3895-283-20/35P.

c. Numbers in parentheses following nomenclature callouts on illustrations indicate quan-

tity; numbers preceding nomenclature callouts indicate preferred sequence.

d. Report of errors, omissions and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

e. Report all equipment improvement recommendations as prescribed by TM 38-750.

1-2. Record and Report Forms

a. DA Form 2258 (Depreservation Guide for Vehicles and Equipment).

b. For other record and report forms applicable to operator, crew and organizational maintenance, refer to TM 38-750.

Note. Applicable forms, excluding Standard Form 46 (United States Government Motor Vehicles Operator's Identification card) which is carried by the operator, shall be kept in a canvas bag mounted on equipment.

Section II. DESCRIPTION AND TABULATED DATA

1-3. Description

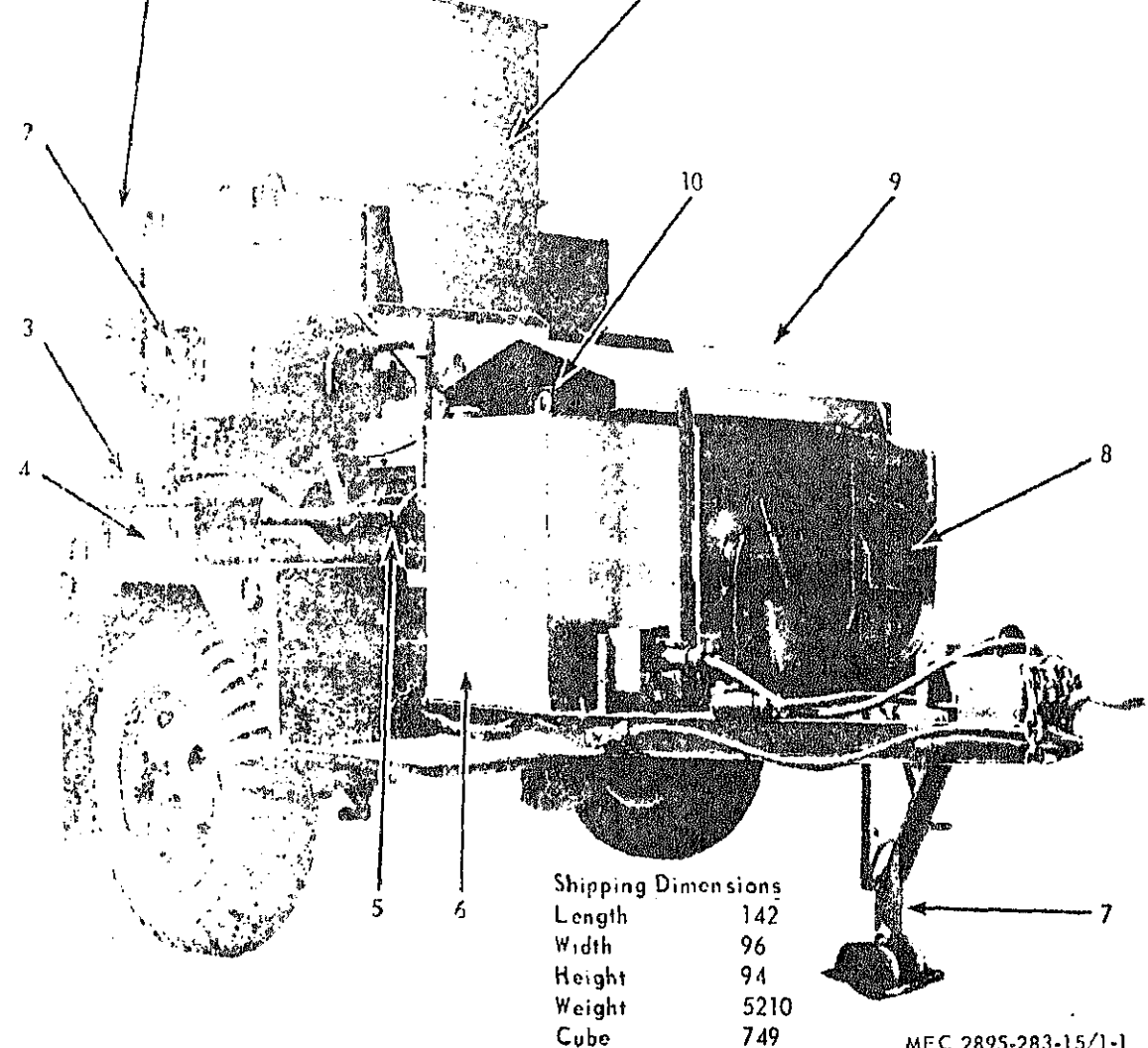
a. The McConnaughay HTD-A-67 Drier-Mixer (figs. 1-1 and 1-2) is a self-contained, wheel mounted, portable unit designed to dry and/or mix sand, gravel or crushed stone with an asphaltic material. The pugmill is used as a combination drying and mixing chamber.

b. The drier-mixer is powered by a Wisconsin MVF4D, four cylinder, air cooled engine with

through the engine mounted clutch reduction gear assembly, then by shafts, sprockets, pulleys, belts and chains to the different components.

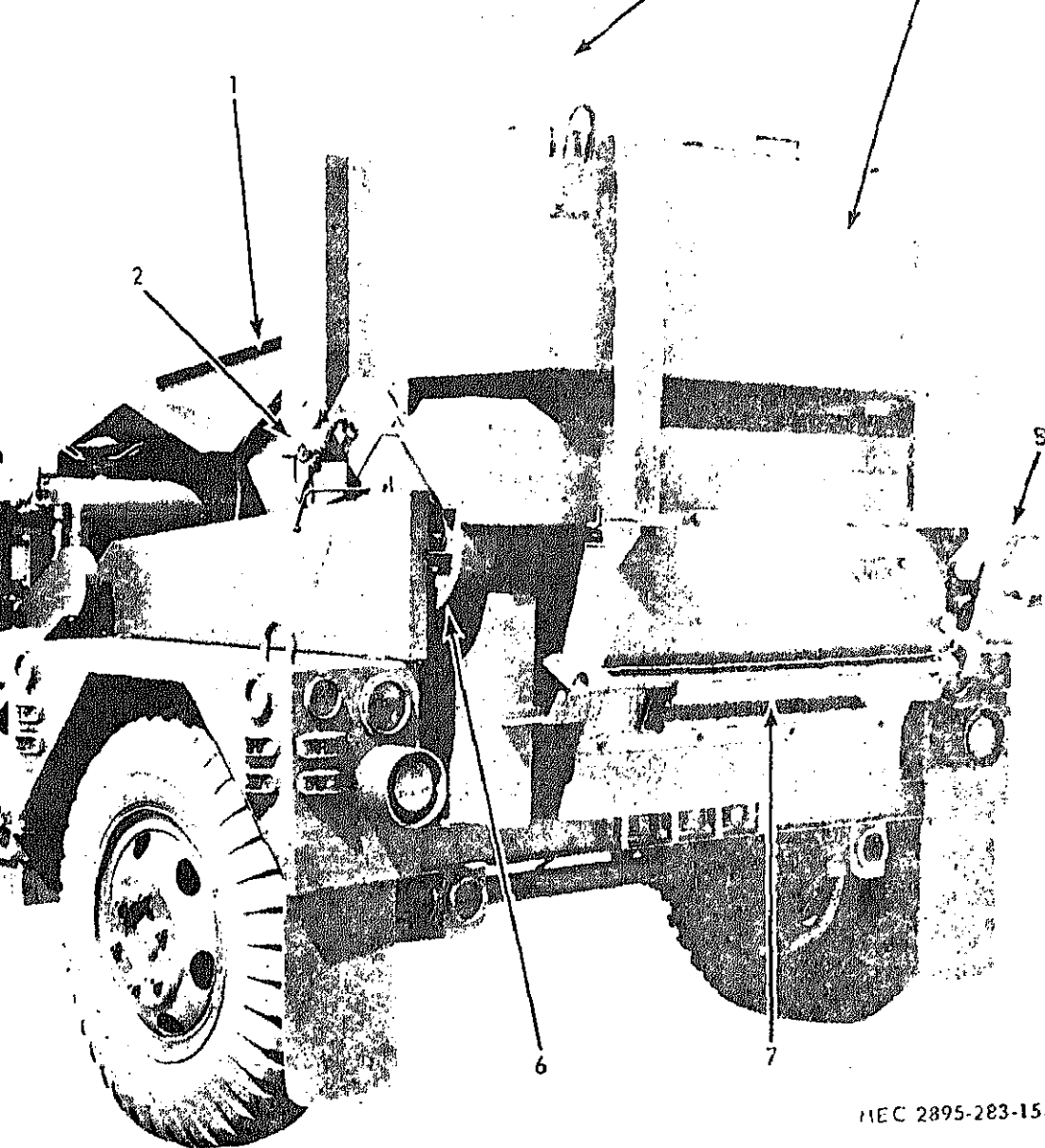
1-4. Identification and Tabulated Data

a. *Identification.* The McConnaughay Model HTD-A-67 Drier-Mixer has six major identification data. The information contained on



- 1 Asphalt Tank
- 2 Thermometer
- 3 Discharge Gate Lever
- 4 Tool Box
- 5 Asphalt Pump Mounting Group
- 6 Fuel Oil Tank
- 7 Landing Leg
- 8 Engine
- 9 Charging Hopper
- 10 Timer
- 11 Exhaust Stalk and Extension

Figure 1-1. Drier-Mixer, Right Front, Three-Quarter View with Shipping Dimensions.



NEC 2895-283-15-1-2

- 1 Charging Hopper
- 2 Control Valve Asphalt Tank Burner
- 3 Oil Filter
- 4 Air Filter
- 6 Engine
- 6 Blower
- 7 Discharge Gate
- 8 Discharge Gate Lever
- 9 Asphalt Tank
- 10 Exhaust Stack Extension

Figure 1-2. Drier-Mixer, Left Rear, Three-Quarter View.

Manufacturer ... McConnaughay Mixers Incorporated
 Model ... HTD-A-67
 Type ... II
 Serial Number ... 84-143

(2) *Engine.*

Manufacturer ... Wisconsin Motor Corporation
 Type ... V-block air-cooled
 Model ... MVF4D
 Bore ... 3 1/4 inch
 Stroke ... 3 1/4 inch
 Fuel ... Gasoline
 Piston

Displacement ... 107.7 cubic inches
 Specification
 number ... 298,206
 Firing order ... 1-3-4-2
 Cycle ... 4
 Number of
 cylinders ... 4
 Rated horsepower 21.0
 Revolutions per
 minute ... 1800

(b) *Carburetor*
 Manufacturer ... Zenith Carburetor Div.
 Corp.

Model ... S-632-B
 Type ... Updraft Single Venturi

(c) *Fuel Strainer.*

Manufacturer ... Tillotson Manufacturing
 Model ... OW-418-T

(d) *Air Cleaner.*

Manufacturer ... Donaldson Company, Inc.
 Model ... KAX00-0354
 Type ... Oil Bath

(e) *Fuel Pump.*

Manufacturer ... Wisconsin Motor Corporation
 Model ... LY-38-C

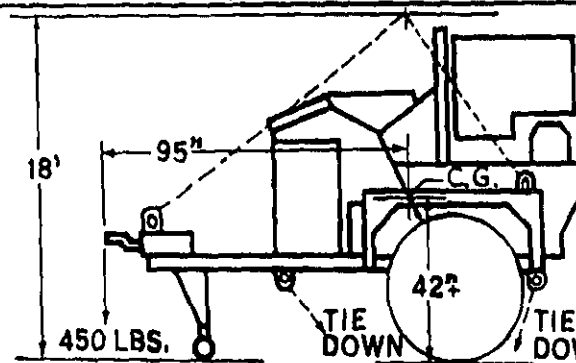
(f) *Spark Plugs.*

Manufacturer ... Champion Spark Plug, Co.
 Type ... XMD-21
 Size ... 18 Millimeter

(g) *Clutch Reduction Gear As.*

Manufacturer ... Wisconsin Motor Corporation

TRANSPORTATION DATA FOR MIXER - DRYER, BITUMINOUS-CONCRETE MATERIALS, WHEEL MOUNTED, GASOLINE ENGINE DRIVEN, 10 T.P.H. RATED CAPACITY



3 LIFTING RING
 8000# CAPACITY

8 TIEDOWN RING
 10,000 # CAPACITY

4760 AXLE LOAD

OVERALL LENGTH 142 IN.
 OVERALL WIDTH 96 IN.
 OVERALL HEIGHT 108 IN.
 HEIGHT REDUCIBLE 94 IN.

SHIPPING CUBAGE 749 CU

off shaft Counter Engine Wisconsin
 (4) Capacities.
 Fuel tank 17 gallon
 Engine crankcase 5 quarts
 Air Cleaner 1 quart
 Clutch reduction
 gear assembly 1½ quarts
 Fuel oil tank 10 gallon

(5) Nut And Bolt Torque Data
 Spark plugs 25-30
 Cylinder head-
 bolts and nuts 22-24
 Intake manifold
 screws 14-18
 Gear Cover 14-18
 Flywheel bolt 35
 Main bearings 25-30
 Connecting Rods 22-24
 Oil Pan 6-10

(6) Adjustment Data.
 Spark plug gap 0.030 inches

Valve lifters 0.015 inches
 (engine cold)
 Intake 0.008 inches
 Exhaust 0.016 inches

(7) Dimensions and Weight (fig. 1-1).
 Length 142 inches
 Width 96 inches
 Height 108 inches
 Height reducible 93 inches
 Weight 5210 pounds
 Volume 749 cubic feet

(8) Wiring Diagram (fig. 1-4).

(9) Base Plan (Frame) (fig. 1-5).

1-5. Difference in Models

This manual covers only the McConnaughay Model HTD-A-67 Drier-Mixer. No known unit differences exist for the model covered by this manual.

U. S. ARMY			
DRIER-MIXER, BITUMINOUS-CONCRETE, WHEEL MNTD., GASOLINE ENGINE DRIVEN			
STOCK NO.	3895-832-6230		
SER. NO.		REG. NO.	
MFGR.	MCCONNAUGHAY	MODEL	HTD-A-67
CONT. NO.	DAAKO1-67-G-1230	DATE MFD.	1967
LENGTH	142"	WIDTH	96"
HEIGHT	94"		
CAP. OR PAYL'D.	10 T. P. H.-3 CU. FT.	G. V. W.	LB
SHIP. WT.		CUBE	749 FT.
ENG. MFGR.	WISCONSIN MOTOR CORP.		
MODEL	MVF4D	ENG. SER. NO.	
INSP. STAMP		DATE INSP.	

CAUTION PLATE

DO NOT OPERATE BURNER FOR MORE
THAN THREE MINUTES WITH THE
MIXER EMPTY.

DO NOT HEAT THE BITUMINOUS MATERIAL
ABOVE ITS FLASH POINT.

C. Burner Caution Plate

WISCONSIN HEAVY-DUTY <i>Air-Cooled</i> ENGINE®		SIZE SPEC NO.
MODEL SERIAL NO.	NET CONT. BHP	R.P.M.
TEMPERATURE +40° to +120°F -10° to +40°F -65° to -10°F	CRANKCASE OIL MIL-L-2104 Grade 30 MIL-L-2104 Grade 10 MIL-L-10295 Grade OES	GASOLINE MIL-G-3056 Type 1 MIL-G-3056 Type 1 MIL-G-3056 Type 2
TO START ENGINE: -25°F to +120°F 1. Open gasoline valve at tank. 2. Close choke fully and crank once. 3. Open choke half-way and repeat cranking. 4. After engine starts, open choke fully.	TO START ENGINE: -65°F to -25°F 1. Apply starting aids. 2. Follow instructions for starting at -25 to +120°F. 3. Operate engine at 1800 RPM and no load for 10 minutes minimum. 4. Increase speed to rated value and operate for 5 minutes before applying load.	
TO STOP ENGINE: Idle for a few minutes to cool engine before stopping. Depress stop button on magneto or ignition switch.		
MAINTENANCE: Drain and refill crankcase every 50 hours of operation. Change oil filter cartridge every 100 hours. Spark plug gap .030". Keep clean all in air channel.		
WISCONSIN MOTOR CORPORATION MILWAUKEE, WISC. U.S.A.		

D. Engine Data Plate

CLUTCH ADJUSTMENT — DISENGAGE CLUTCH.
TURN ADJUSTING COLLAR CLOCKWISE UNTIL A FIRM
PRESSURE IS REQUIRED TO ENGAGE CLUTCH.

**CAUTION — BE SURE THAT CAMS GO OVER CENTER
ON FINAL ADJUSTMENT. REFER TO OPERATING
MANUAL FOR ADDITIONAL INFORMATION.**

**WISCONSIN MOTOR CORP.
MILWAUKEE, WISCONSIN-U.S.A.**



SD-125-A



E. Clutch Data Plate


CLUTCH ADJUSTMENT

RELEASE CLUTCH, LOOSEN
LOCK SCREW, AND TURN
COLLAR CLOCKWISE TO
TIGHTEN

SPEC. NO. MUST
BE GIVEN WHEN
ORDERING PARTS

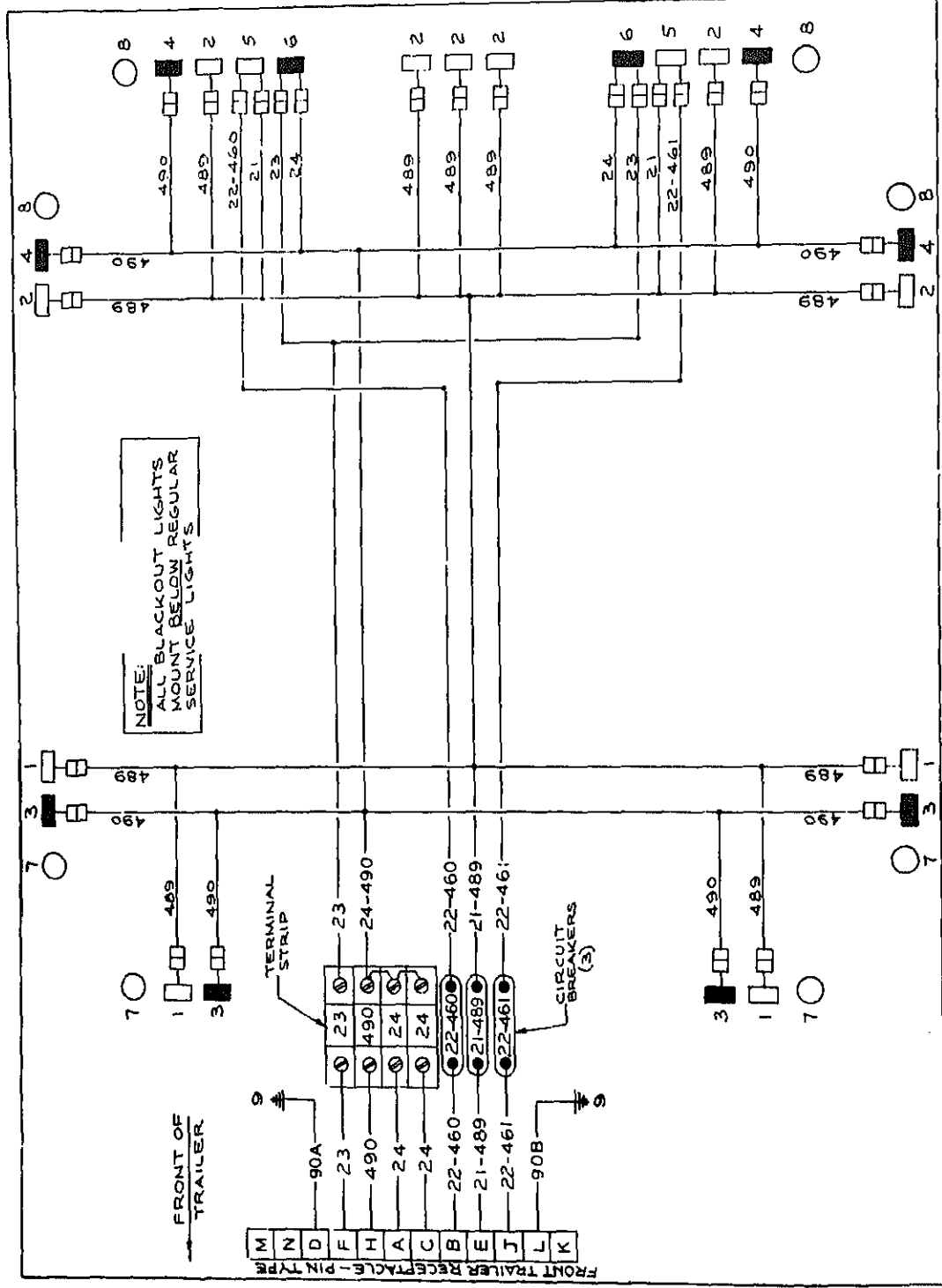
TWIN DISC CLUTCH CO.
MADE IN U.S.A.

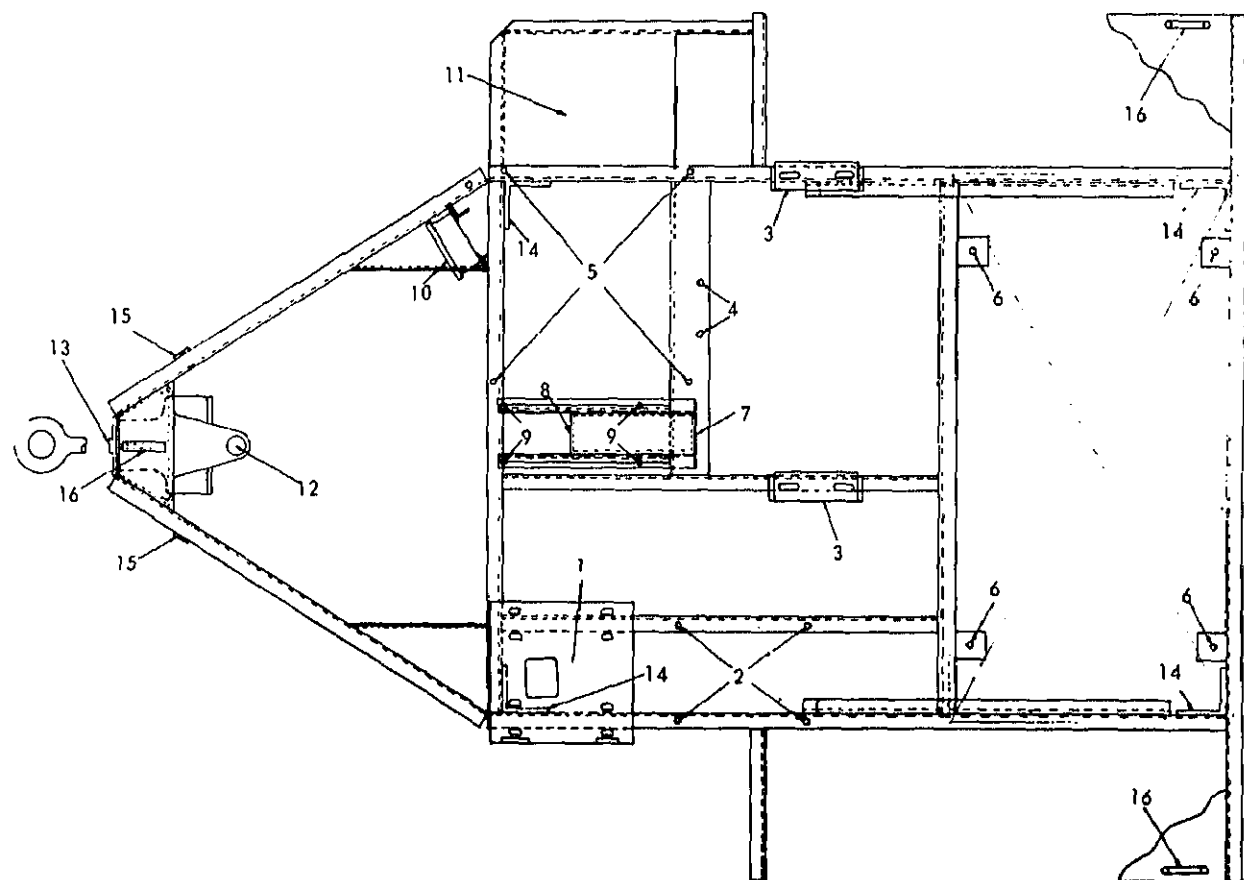
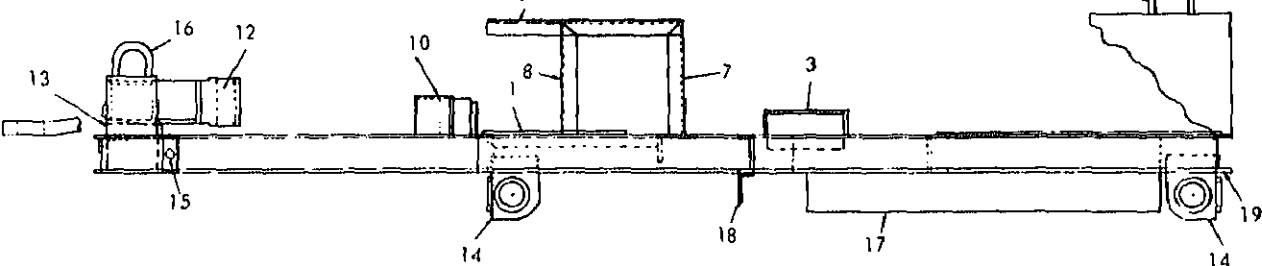
RACINE, WIS.
A1791



P. Asphalt Pump Clutch Data Plate

MEC 3895-283-15/1-3④





MEC 3895-283-15/1-5

- | | |
|-----------------------------|-------------------------|
| 1 Motor Mount | 11 Operator Step |
| 2 Gas Tank Mount | 12 Landing Leg Mount |
| 3 Jackshaft Mount | 13 Lunette Mount |
| 4 Tie-Down Fixture | 14 Tie-Down Fixture |
| 5 Fuel Oil Tank Mount | 15 Brake Air Hose Mount |
| 6 Mixing Tub Mount | 16 Lifting Device |
| 7 Master Cylinder Mount | 17 Spring Mount |
| 8 Brake Relay Valve Mount | 18 Chock Cradle Mount |
| 9 Brake Air Reservoir Mount | 19 Mud Flap Mount |
| 10 Electric Nose-Box Mount | |

CHAPTER 2

INSTALLATION AND OPERATION INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

1. Unloading Equipment

a. Shipment By Tractor. When the mixer is moved to its destination by a tractor; block wheels of mixer and lower landing leg before hitching from tractor.

b. Shipment By A Carrier. When the mixer is hauled to its destination by a rail flatcar or truck flatbed:

(1) Remove all tiedown cables and wheel chocks from the unit and the carrier (fig. 2-1).

(2) When towing from carrier use a ramp capable of supporting both vehicles and block the wheels of the carrier. Do not hook-up brakes on preserved units, as this will ruin preservation and brake shoes.

(3) When lifting from carrier use a lifting device with a capacity of at least 10,000 pounds (fig. 1-3).

Warning: Do not allow unit to roll freely down the ramp. Do not allow unit to swing away while suspended

2. Unpacking Equipment

a. Remove stack extension attached to the mixer and the other components found in the tool box.

b. Remove preservatives, seals, paper and tape from components of the unit.

c. Accomplish depreservation as outlined in DA Form 2258.

3. Inspecting and Servicing Equipment

a. Inspection.

(1) Inspect the mixer for missing parts and possible damage.

(2) Inspect all wiring, plumbing, mounts and engine accessories to see that there

b. Servicing.

Perform the daily preventive maintenance steps as listed in paragraph 3-6.

2-4. Installation of Separately Packaged and Packed Components

a. Stack Extension. The extension is used to further elevate the exhaust from the mixer's drying and mixing chamber. Refer to figure 2-2A to install the stack extension.

b. Fuel Oil Pump and Blower Belts. The belts are normally stored in the tool box when packed for shipment. Refer to figure 2-2B to install the belts.

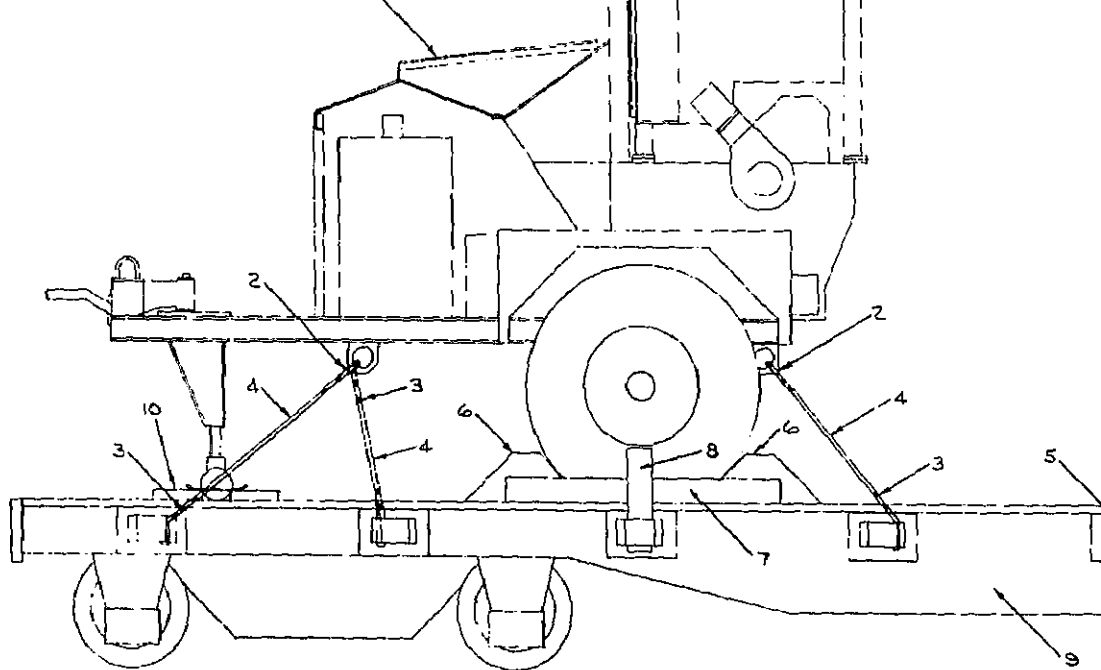
c. Hand Crank. The starting hand crank for the engine will be found in the tool box. Place on bracket located on the front panel of the engine.

2-5. Installation or Setting-up Instructions

a. The drier-mixer is designed to operate in conjunction with a dump truck 5-ton, 6 x 6, M51 (in towing position) so that the aggregate can be shoveled into the charging hopper. The unit should be situated on firm ground with wheel chock blocks in position and the landing leg down to support the unit.

b. If the drier-mixer is to be operated indoors, follow the above instructions, plus vent engine and burner exhaust outside. It is best not to operate this unit in an enclosed area since it is nearly impossible to vent all of the exhaust outside.

Warning: Do not operate the drier-mixer in an enclosed area unless the exhaust gases are piped to the outside. Inhalation of exhaust



FLATCAR BLOCKING AND TIEDOWN (TYPICAL)

MEC 3895-2

- 1 Drier-Mixer
- 2 Clevis
- 3 Cable Clamps
- 4 Cable
- 6 Stake Pocket
- 6 Chock Block
- 7 Side Cleat
- 8 Stake
- 9 Flatcar
- 10 Blocking

Figure 2-1. Drier-Mixer Secured for Shipping.

Section II. MOVEMENT TO A NEW WORKSITE

2-6. Dismantling for Movement

a. No disassembly of the machine is required when moving to a new worksite, unless low clearance is anticipated; then the stack extension can be removed. Refer to paragraph 2-4a.

b. Connect lunette, safety chains, air brake hoses and electrical connection to the towing vehicle.

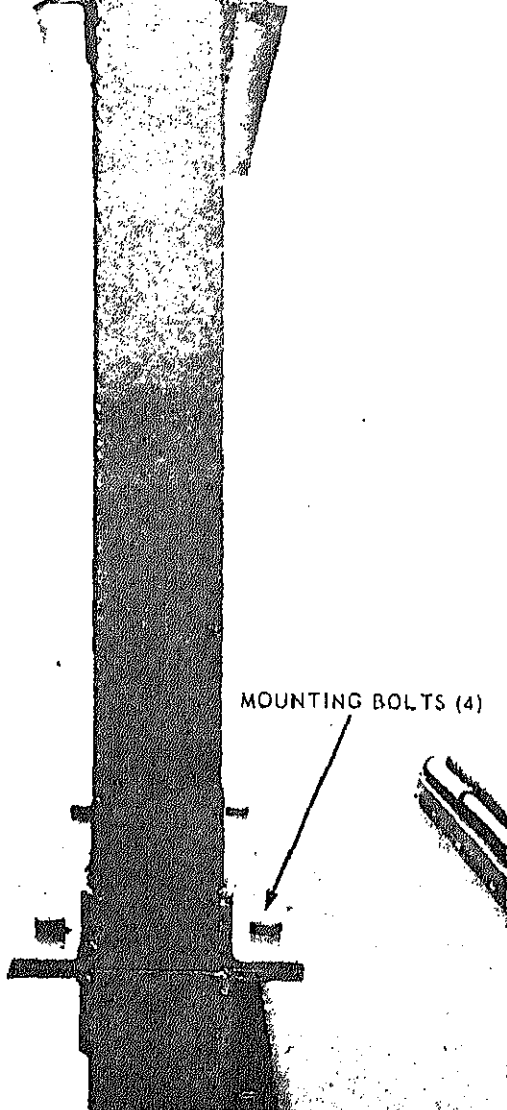
c. Raise jack in landing leg and leg in the up position.

d. Place wheel chock blocks in cra

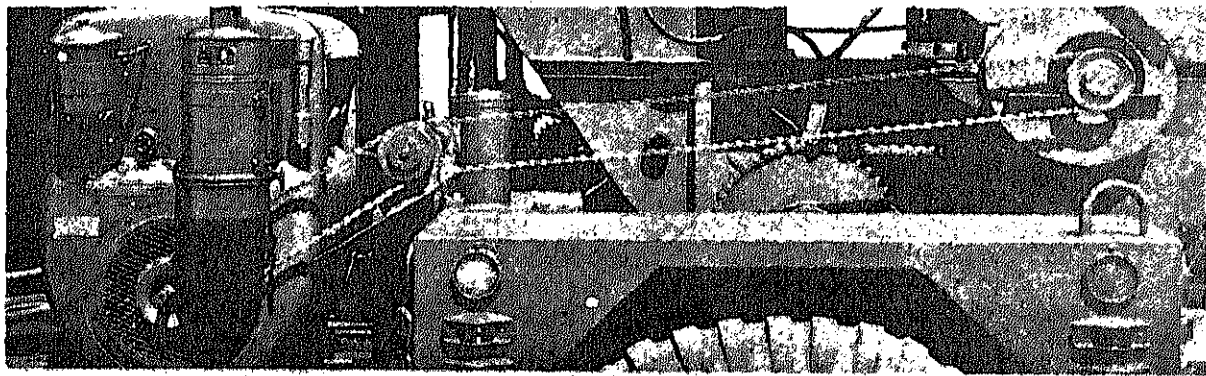
Note. The lunette has two height a other height adjustments are to be made in the landing leg.

2-7. Reinstallation after Movement

Refer to paragraph 2-5.



A. Installation of Stack Extension



B. Installation of Belts for Fuel Pump and Blower

2-8. General

This section describes, locates, illustrates and furnishes operator, crew or organizational maintenance personnel sufficient information about various controls and instruments for proper operation of the McConnaughay Model HTD-A-67 Drier-Mixer.

2-9. Controls and Instruments

a. Purpose. The purpose of the controls and instruments are illustrated in figure 2-3.

b. Engine Controls.

(1) *Magneto switch.* The magneto push-pull switch (fig. 2-30) is located on engine control panel under oil filter; pull switch out when starting and running engine, depress switch to stop engine.

(2) *Choke control.* The choke control located on engine control panel is a push-pull rod. Movement of the rod controls flow of air to carburetor when starting engine and while engine is running.

(3) *Governor control.* The governor control located on engine control panel is a push-pull rod with a locking device. Movement in or out regulates speed of engine; the locking device maintains desired engine speed.

(4) *Fuel primer.* The fuel primer located at rear of engine and fuel strainer is a push-pull fuel pump. Twenty to thirty strokes on pump fills an empty carburetor.

(5) *Fuel strainer shut-off cock.* The fuel strainer and shutoff cock assembly is located on rear engine panel. It controls and strains fuel flow from the fuel tank.

(6) *Engine starting hand crank.* The starting hand crank is stowed on engine front panel. With all engine controls placed in starting position, the hand crank is positioned to rotate the engine crankshaft.

(7) *Magneto emergency ground switch.* The emergency ground push-pull switch is located at bottom of magneto and is pulled out when engine is started and running. It is depressed when an emergency exists due to malfunction of the drier-mixer.

The hour meter tachometer is mounted gine front control panel. It indicates tions per minute and accumulated ho running time.

c. Mixer Controls.

(1) *Master clutch control lever.* The ter clutch control lever is located to rear of the engine. Activation of this engages or disengages the engine power reduction clutch assembly.

(2) *Asphalt pump clutch lever.* The phalt pump clutch lever is located on the side of the mixer and mounted to the pump base. Actuation of this lever eng disengages power to the asphalt pump.

(3) *Asphalt pump counter.* The counter located on the right side of the mixer is mounted to the asphalt pump base. This records revolutions made by the asphalt pump.

(4) *Batch timer.* The timer is located on the right side of the mixer on top of the oil tank. The timer is set for batch time.

(5) *Front gate lever.* The lever is located on the right-front of the pugmill. This lever is used to open the front gate to allow aggregate to enter the pugmill from the charging hopper.

(6) *Discharge gate lever.* The lever is located on the right-rear of the pugmill. This lever is used to open the discharge gate to allow the mix to be discharged from the pugmill.

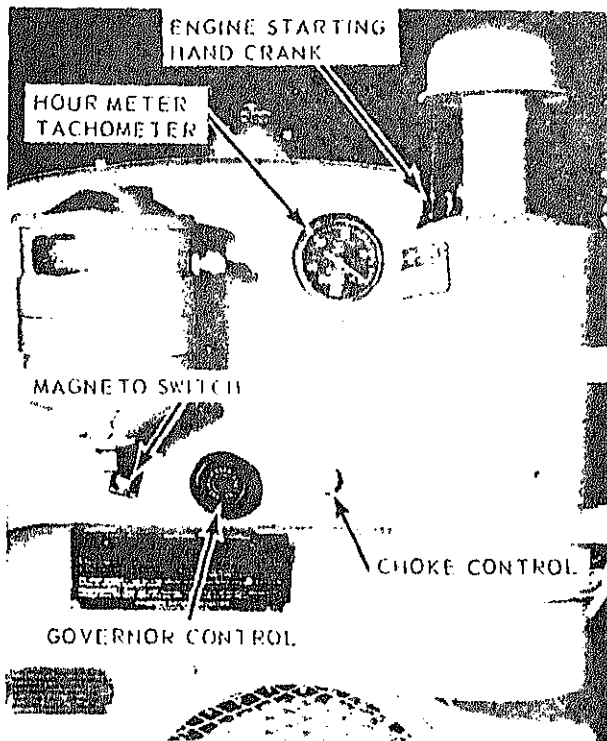
(7) *Asphalt tank thermometer.* The thermometer is equipped with a thermometer in the asphalt tank to indicate the temperature of the asphalt in the tank.

(8) *Burner Controls.* The burner unit is equipped with two burner control valves for two pressure gages.

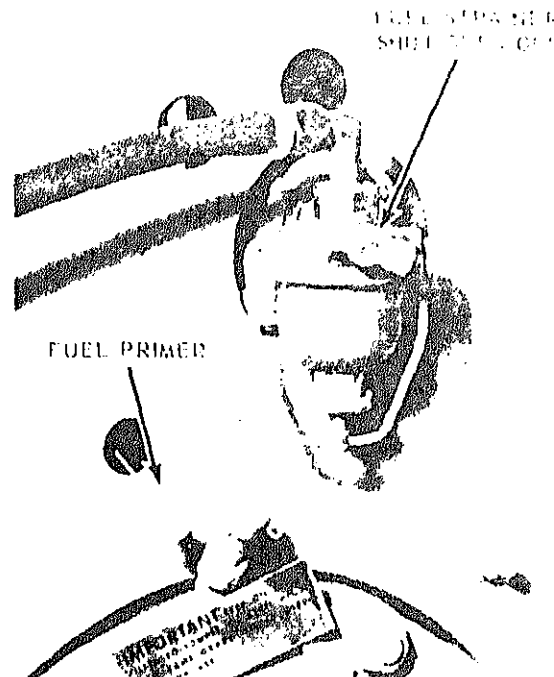
(a) One valve and gage are for control of the main burner (pugmill burner). They are located on the right hand side of the burner unit near the burner unit.

(b) One valve and gage are for control of the asphalt tank burner. They are located on the left hand side of the unit near the blower unit.

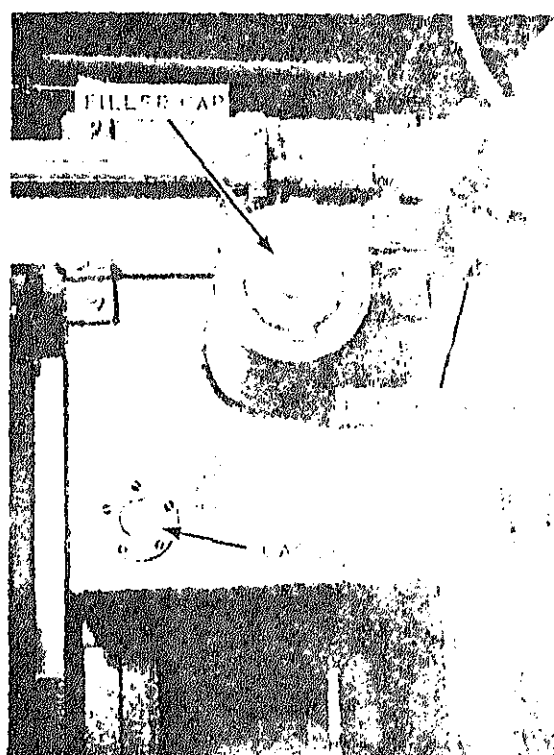
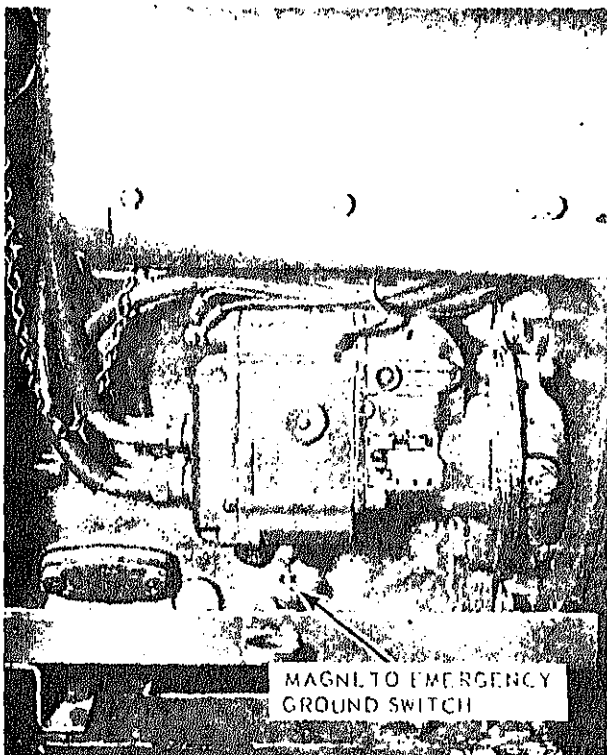
(9) *Ignition air-control.* There is

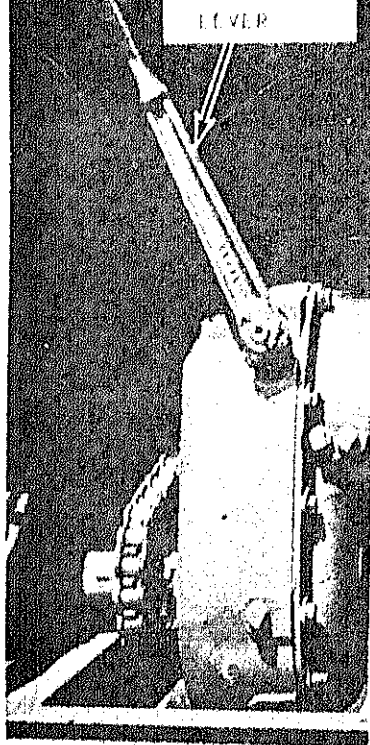


A. Engine Front Panel

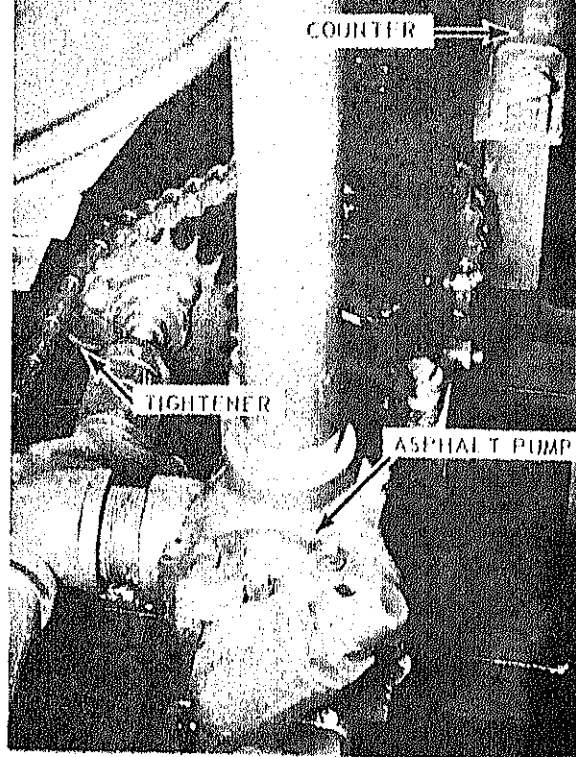


B. Engine Rear Panel





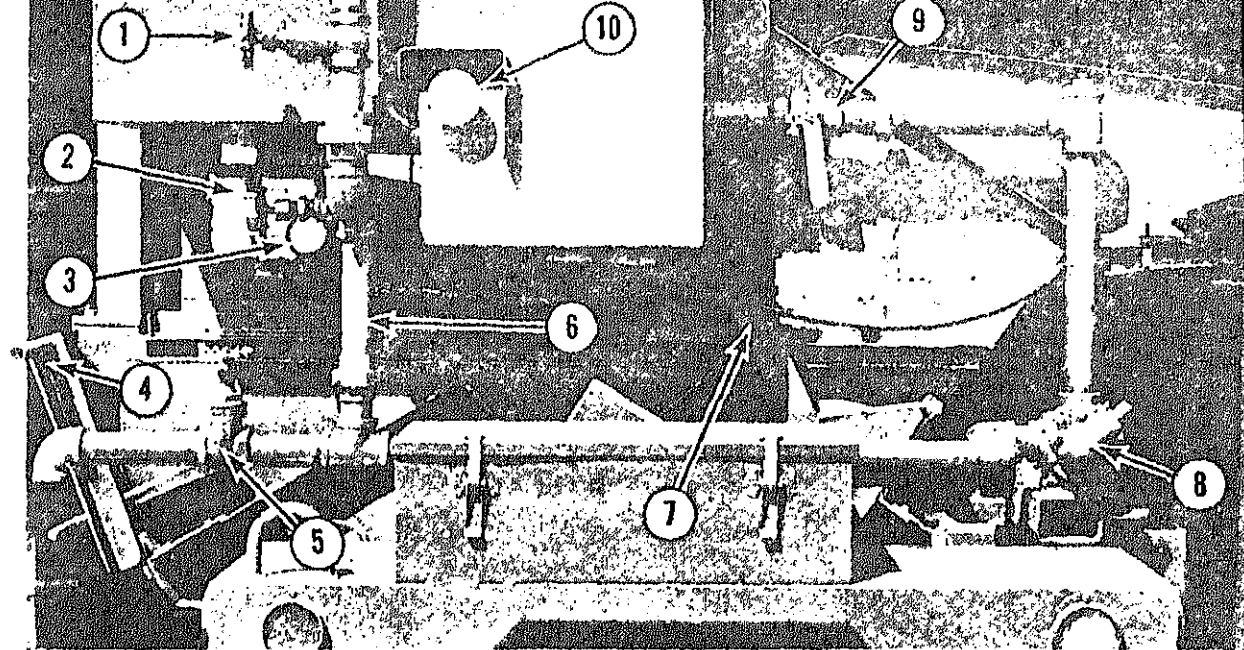
E. Frontal Clutch Reduction
Gear Assembly



F. Asphalt Mounting Group
and Top of Fuel Oil Tank

MEC 3895-283-15/2-3 ②

Figure 2-3②—Continued.

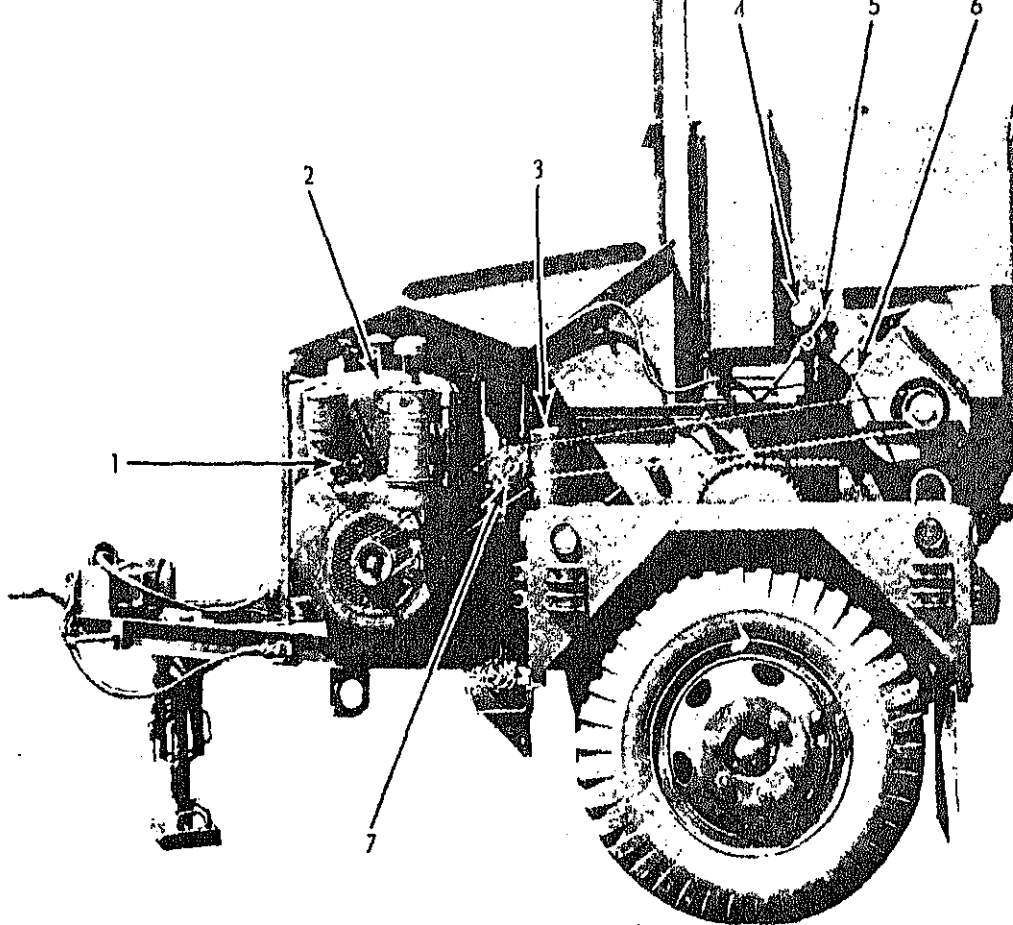


G, Pugmill and Asphalt Tank — Right Hand Side

MEC 3905 283-15 '2-3 (3)

- 1 Valve, Recirculation
- 2 Valve, Pugmill Line
- 3 Gage, Pugmill Burner
- 4 Lever, Discharge Gate
- 5 Valve, Drain Line
- 6 Strainer Valve, Pugmill Burner
- 7 Lever, Front Gate (inlet)
- 8 Asphalt Pump
- 9 Valve, Tank to Pump Line
- 10 Thermometer

Figure 2-3(3)—Continued.



MEC 2895-283-1

- 1 Governor Control
- 2 Hourmeter Tachometer
- 3 Filler Cap
- 4 Gauge Asphalt Tank Burner
- 5 Control Valve Asphalt Tank Burner
- 6 Damper Lever
- 7 Fuel Oil Pump

Figure 2-3①—Continued.

Section IV. OPERATION OF EQUIPMENT

2-10. General

a. Instructions in this section are published for information and guidance of personnel responsible for operation of the drier-mixer.

b. The operator must know how to perform every operation of which the drier-mixer is capable. This section gives instructions on

starting and stopping the drier-mixer, motions of the drier-mixer and on coordinating basic motions to perform specific tasks for which the equipment is designed. Since every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

daily preventive steps as listed in paragraph 3-6.

b. Starting the Engine.

(1) Open the engine fuel strainer shut-off cock (fig. 2-3①).

(2) Prime the engine when required (fig. 2-3①).

(3) Set magneto switch in running position (fig. 2-3①).

(4) Pull governor speed control half open (fig. 2-3①).

(5) Pull choke control button to extreme out position (fig. 2-3①).

(6) Use crank and turn engine over one or two revolutions (fig. 2-3①). Push choke button in about half-way and pull up briskly on the starting crank.

Caution: Do not attempt to spin the engine with the starting crank. If the engine does not start on the first pull of the crank, reengage the crank and repeat the operation.

(7) After engine starts, push in choke button as required for smooth running. Choke control must be completely in when engine is warmed up.

(8) The engine should be allowed to warm up to operating temperature before the load is applied. This requires only a few minutes of running the engine at a moderate speed.

c. Lighting Burner.

(1) Reduce engine speed.

(2) Open valve so that the gage reading is between 60 and 120 psi (pounds per square inch) (fig. 2-3② and 2-3③).

(3) Insert lighted torch through the ignition hole. The torch should be dipped into fuel oil before lighting (do not light dry) (fig. 2-3②, and 2-3③).

(4) Increase engine speed to normal rpm.

(5) Operate the burners at 100 psi on the gage. Do not operate the burners below 60 psi on the gage, as they will drip fuel instead of atomizing it properly.

Note. When lighting asphalt tank burner manually close the damper in the blower extension between steps (2) and (3).

Caution: Do not operate the main burner over 2 minutes without material in the mixing chamber. Do not operate the asphalt tank burner unless the head tube in the tank

perature is located on the tank (fig. 2-3④).

(2) Operate asphalt tank burner only for the length of time needed to raise the temperature of the asphalt to the desired temperature as shown on the accompanying chart, table 2-1.

e. Drier-Mixer Starting and Operation.

(1) Load charging hopper with desired aggregate (fig. 1). This can be done while the asphalt is being heated.

(2) Engage master clutch (fig. 2-3④), and light main burner (fig. 2-3④), by following the steps in paragraph 2-11c.

(3) Open front gate to allow aggregate to enter the pugmill from the charging hopper (fig. 2-3④).

(4) Engage asphalt pump clutch and meter in the desired quantity of asphalt (fig. 2-3④). At the same time set batch timer (fig. 2-3④). Be sure valves in asphalt line are open.

(5) At end of batch cycle open rear gate and allow mix to be discharged to a wheelbarrow or ground (fig. 2-3④).

(6) Repeat the above steps for another batch. Note that the charging hopper can be loaded while a batch is being mixed in the pugmill.

f. For Use in Drying Aggregates.

(1) Fill charging hopper with 5 cubic feet of aggregate.

(2) Follow steps in paragraph 2-11 a, b, and c for starting the engine and lighting the burners, except, do not light the asphalt tank burner.

(3) Engage the main clutch to activate the pugmill mixer.

(4) Open charging hopper gate and allow aggregate to feed into pugmill.

(5) Allow the aggregate to remain in the pugmill until the desired temperature or moisture content is reached. The time in the pugmill will vary with the initial moisture content and the gradation of the aggregate.

g. For Use in the Production of Hot Bituminous Mix.

(1) Hot bituminous mix made with asphalt cement as the binder.

(a) Start engine (para 2-11b).

(b) Light the asphalt tank burner

temperature shown in table 2-1.

(c) Fill charging hopper with 5 cubic feet of aggregate.

(d) Light main burner (para 2-11c).

(e) Open charging hopper, hopper gate and allow aggregate to feed into pugmill.

(f) Heat the aggregate until the desired temperature and moisture content is reached.

(g) Meter in the desired quantity of asphalt and allow to mix for approximately one minute before discharging.

(2) Hot bituminous mix made with cut-back asphalt as the binder.

(a) Start engine (para 2-11b).

(b) Light the asphalt tank burner (para 2-11c) and heat the cut-back asphalt to the desired temperature as shown in table 2-1.

(c) Fill charging hopper with 5 cubic feet of aggregate.

(d) Light main burner (para 2-11c).

(e) Open charging hopper, hopper gate and allow aggregate to feed into pugmill.

(f) Meter in the desired quantity of cut-back asphalt.

(g) Allow the materials to heat and mix until the desired temperature and moisture content are reached before discharging.

(3) Hot bituminous mix made with asphalt emulsion as the binder.

(a) Start Engine (para 2-11b).

(b) Light the asphalt tank burner (para 2-11c) and heat the asphalt emulsion to the desired temperature as shown in table 2-1.

(c) Fill charging hopper with 5 cubic feet of aggregate.

(d) Light main burner (para 2-11c).

(e) Open charging hopper, hopper gate and allow aggregate to feed into pugmill.

(f) Meter in the desired quantity asphalt emulsion.

(g) Allow the materials to heat and mix until the desired temperature and moisture content are reached before discharging.

h. For Use in the Production of Cold Mixes. Follow the steps in paragraph 2-11f(2) or (3), except do not light pugmill burner.

i. For Use in the Production of Concrete.

(1) Fill charging hopper with the desired

and mix for at least one minute before discharging.

Note. When making concrete do not use any heat.

Caution: Do not change materials in the asphalt tank from water or emulsion to cut-backs or asphalt cement, or vice-versa without first thoroughly cleaning and drying the asphalt tank.

Note. The metering system should be calibrated with each change of materials. This can be done by running the pump to fill the asphalt lines, then catching and weighing the amount pumped in 100 revolutions. By dividing this weight by 100, the weight per one revolution of the pump is found. The asphalt pump delivers .125 pounds per revolution when pumping 85/100 penetration asphalt at 300°F.

Note. There are two valves located on the two 1¼" lines that discharge the asphalt into the pugmill. These valves are used to equalize the quantity of asphalt discharged on each side of the pugmill. Once these valves are set, they should not be moved.

2-12. Stopping

a. Drier-Mixer.

Note. When stopping the drier-mixer for short intervals of time only, disengage master and asphalt pump clutches and stop the burners.

(1) *Stopping Burners.* To stop the burners shut off the fuel valves to each. Allow blower to run for 3 to 5 minutes (engine speed of 1000 to 1200 RPM is satisfactory) to prevent burner heat distortions, nozzle clogging, and eventual clogging of burner air slots from manifold residual fuel burning at shut down.

(2) Clean out the metering system and drier-mixer as outlined (fig. 2-4).

b. Engine.

(1) If the engine has been running hard and is hot, do not stop it abruptly from full load, but remove the load and allow engine to run idle at 1000 to 1200 rpm (revolutions per minute) for three to five minutes, depending on how hot the engine has been. This will reduce the internal and external temperature of the engine much faster, due to air circulation from the flywheel.

(2) Depress magneto switch (fig. 2-3①).

(3) Return governor, choke and primer control rod to inposition.

ASPHALT CEMENT	RECIRCULATION TEMP.	WORKING TEMP.	FLASH POINT
AC 85-100 penetration	200 Deg. F.	300 Deg. F.	450 Deg. F.
AC 100-120 "	200 Deg. F.	300 Deg. F.	425 Deg. F.
AC 120-150 "	175 Deg. F.	300 Deg. F.	425 Deg. F.
AC 150-200 "	175 Deg. F.	300 Deg. F.	425 Deg. F.
CUT-BACK ASPHALT			
RC 5	105 Deg. F.	200 Deg. F.	80 Deg. F.
RC 4	75 Deg. F.	175 Deg. F.	80 Deg. F.
RC 3	60 Deg. F.	150 Deg. F.	80 Deg. F.
MC 5	105 Deg. F.	225 Deg. F.	150 Deg. F.
MC 4	75 Deg. F.	200 Deg. F.	150 Deg. F.
MC 3	60 Deg. F.	175 Deg. F.	150 Deg. F.
ASPHALT EMULSION			DO NOT HEAT ABOVE
RS 1	60 Deg. F.	120 Deg. F.	150 Deg. F.
MS 1	60 Deg. F.	120 Deg. F.	
MS 2	60 Deg. F.	120 Deg. F.	
MS 3	60 Deg. F.	120 Deg. F.	

Note. Do not change asphaltic materials in the asphalt tank from emulsion to cut-backs or emulsions to asphalt cements or vice-versa without first thoroughly cleaning and drying the asphalt tank, as the asphalt will foam when mixed with emulsions and heated.

2-13. Operation Under Unusual Conditions

a. Operation In Extreme Cold (Below 0° F).

(1) Use light weight oil SAE-10 (MIL-L-2104) or subzero engine oil (MIL-L-10295) in the engine crankcase.

(2) Follow instructions (para 2-11b), for starting the engine.

(3) Operate engine at 1800 rpm without load for a minimum of fifteen minutes.

(4) Engage main and asphalt pump clutches slowly.

b. Operation In Extreme Heat.

(1) No particular changes should be made.

(2) Follow instructions for starting and operating the drier-mixer (para 2-11).

c. Operation In Dusty or Sandy Areas.

(1) Increase the frequency of lubrication service as conditions demand. Service and clean the air cleaner and the engine crank case filler cap, daily. Store all lubricants as instructed.

(2) Clean the fuel strainer screen and sediment bowl daily.

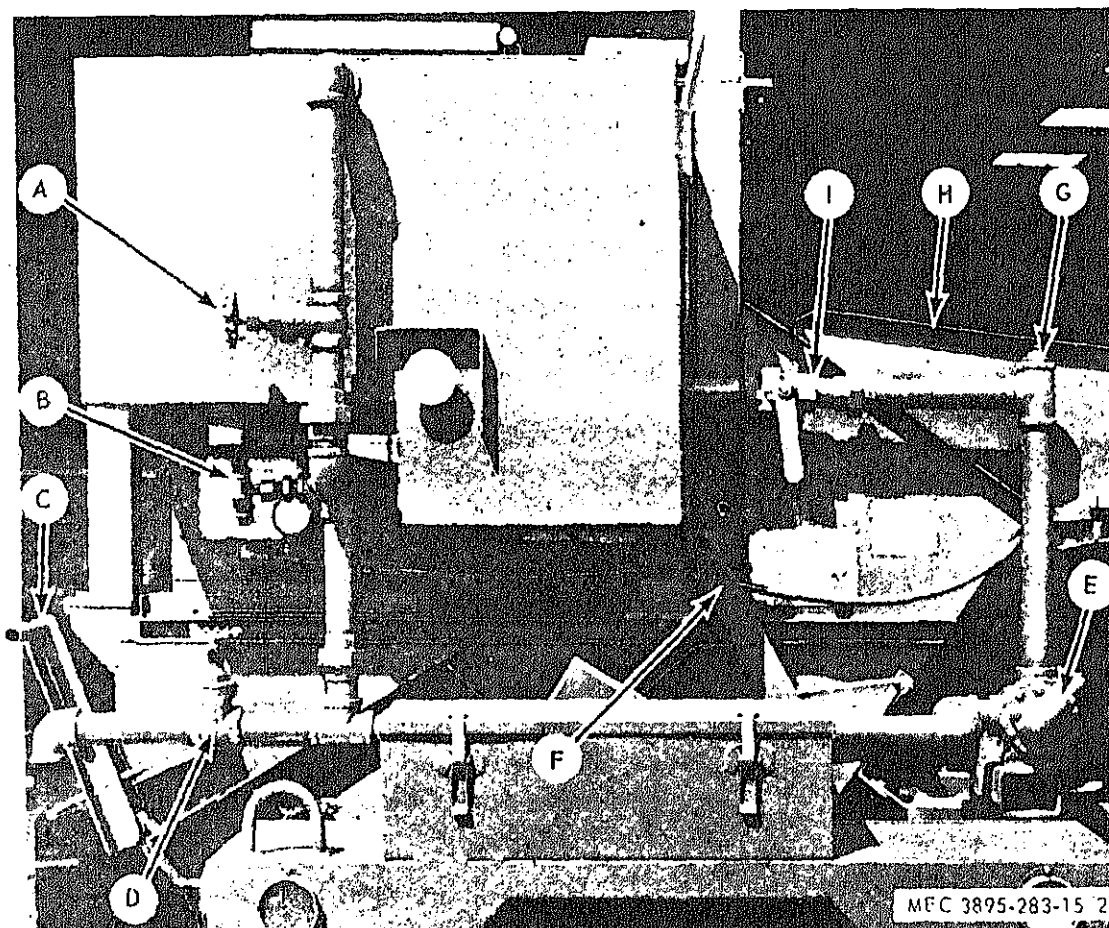
(3) Maintain a clean mixer exterior.

d. Operation In Salt Water or High-Humidity Areas.

(1) *Salt water areas.* When possible, locate the mixer so that it is protected from salt water by natural barriers; otherwise, erect a barrier from available materials for salt water spray protection. Flush the entire mixer down with fresh water frequently and wipe dry.

Caution: Do not allow water to get into asphalt tank. Water in tank will cause the asphalt to foam and overflow the tank when it is heated.

(2) *High-humidity areas.* During extended shut-down periods, completely cover the mixer with a canvas or waterproof material. Protect exposed and unpainted areas from rusting by applying paint as soon as possible. During sunny or dry periods, remove the engine side panels and allow the engine to dry out. Fill the fuel tanks frequently and be sure that they are full at the end of the day's operation to prevent condensation. Service the fuel strainer daily and increase the frequency of lubricating services required in the lubrication order.



MFC 3895-283-15 2

- 1 Check to see that valves A and I are closed.
- 2 Shut off burners, leaving Drier-Mixer running.
- 3 Fill charging hopper with aggregate.
- 4 Open front gate and allow aggregate to enter pugmill (lever F).
- 5 Remove plug G.
- 6 Open Valve B.
- 7 Engage asphalt pump clutch (lever E) and pour fuel oil into line at opening G, which allows fuel oil to be pumped through the system and into the pugmill.
- 8 Disengage asphalt pump clutch and fill line with fuel oil before replacing plug G. This allows fuel oil to stand in the line and pump.
- 9 Discharge aggregate and oil mix in pugmill (lever C).
- 10 Shut down Drier-Mixer.

Note. Before starting next time open valve D and drain fuel oil out of the lines and pump.

Figure 2-4. Cleaning Out of Metering System and Drier-Mixer

2-14. Instruction

This section contains detailed instructions on the operation of fire extinguishers of which two are supplied for use with the drier-mixer.

2-15. Fire Extinguisher (Monobromotrifluoromethane Type)

a. Description. The monobromotrifluoromethane type fire extinguisher is generally suitable for all types of fire, except fires involved with LOX (liquid oxygen) generating equipment. The fire extinguisher is furnished with a disposable type cylinder.

b. Operation. To operate the fire extinguisher, perform the following:

- (1) Remove fire extinguisher from its location.
- (2) Break seal by pulling safety pin from handle.
- (3) Point horn at base of flame.
- (4) Press trigger for discharge and direct stream at base of flame.
- (5) Replace cylinder immediately after using.

c. Replacement of Cylinder. To replace cylinder, perform the following:

- (1) Press lever to release pressure from used cylinder.
 - (2) Loosen swivel valve coupling nut and remove valve assembly from used cylinder.
 - (3) Remove instruction band from used cylinder.
 - (4) Place new cylinder through instruction band.
 - (5) Replace safety pin in valve and seal pin with sealing wire.
 - (6) Attach valve assembly and tighten swivel coupling nut on the new cylinder and place fire extinguisher in mounting bracket.
 - (7) Adjust instruction band on cylinder to show maintenance and operating instructions.
- d. Maintenance.* Weigh fire extinguisher every 3 months and replace cylinder if gross weight has decreased 4 ounces or more. Lubricate cylinder neck threads with one drop of OE 30 oil before reassembly.

CHAPTER 3

OPERATOR AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. OPERATOR AND ORGANIZATIONAL MAINTENANCE TOOLS AND EQUIPMENT

3-1. Special Tools and Equipment

No special tools or equipment are required by the operator or organizational maintenance personnel for the maintenance of the drier-mixer.

3-2. Basic Issue Tools and Equipment

Tools and repair parts issued with or authorized for the drier-mixer are listed in the Basic Issue Items list, Appendix B of this manual.

Section II. LUBRICATION

3-3. General Lubrication Information

For the current lubrication order, refer to DA-PAM-310-4.

3-4. Detailed Lubrication Information

a. General. Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Allow no dust, dirt, or other foreign material to mix with the lubricants. Keep all lubrication equipment clean and ready for use.

b. Cleaning. Keep all external parts not requiring lubrication clean of lubricants. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after lubricating to prevent accumulation of foreign matter.

c. Deleted.

d. Special Lubrication Instructions for Unusual Conditions. The intervals of lubrication

will be more frequent when operating the drier-mixer during extremely high temperatures, in dust or sand, or under any conditions which tend to destroy the protective quality or quantity of the lubricant.

e. OE Oil (Oil Engine).

(1) The crankcase oil level must be checked frequently as oil consumption may increase.

(2) The oil may require changing more frequently than usual because contamination will increase under cold weather operating conditions.

f. Engine Oil Filter. Service the oil cleaner as illustrated in figure 3-2.

g. Engine Air Cleaner. Service the air cleaner as illustrated in figure 3-3.

h. Magneto Cam Wick. Service the magneto cam wick as illustrated in figure 3-4.

i. Deleted.

Section III. PREVENTIVE MAINTENANCE SERVICES

3-5. General

To insure that the drier-mixer is ready for operation at all times, it must be inspected

damage or failure. The necessary preventive maintenance services to be performed are listed

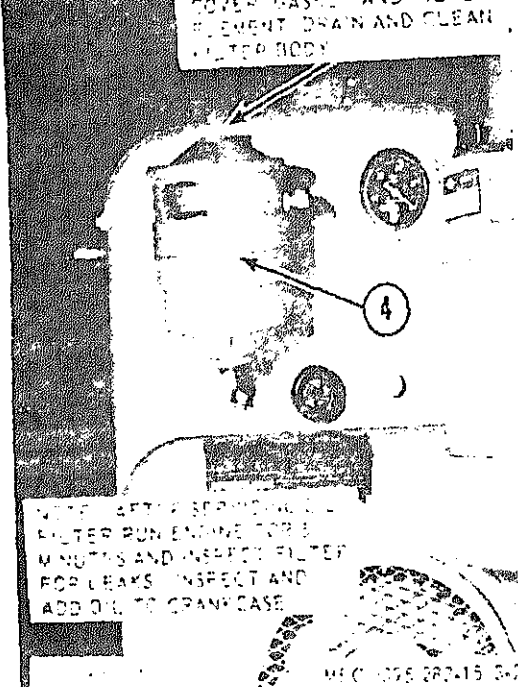


Figure 3-2. Engine Oil Filter.

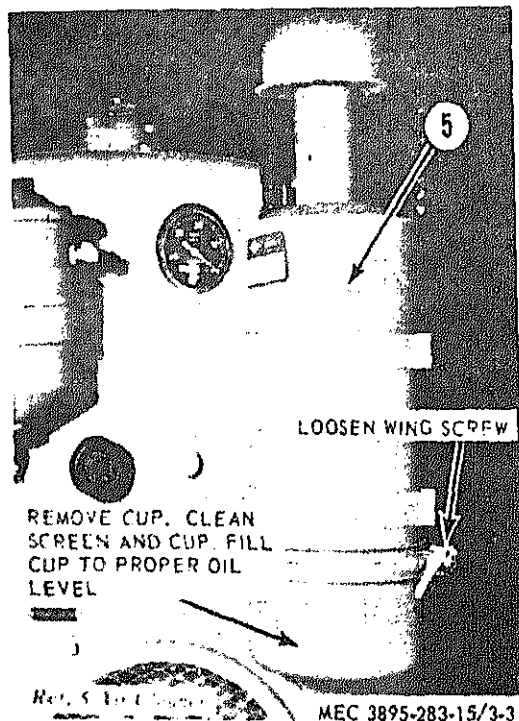


Figure 3-3. Engine Air Cleaner.

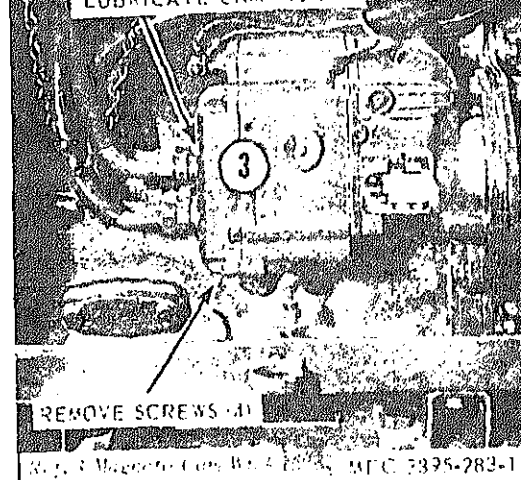


Figure 3-4. Magneto Cam Wick.

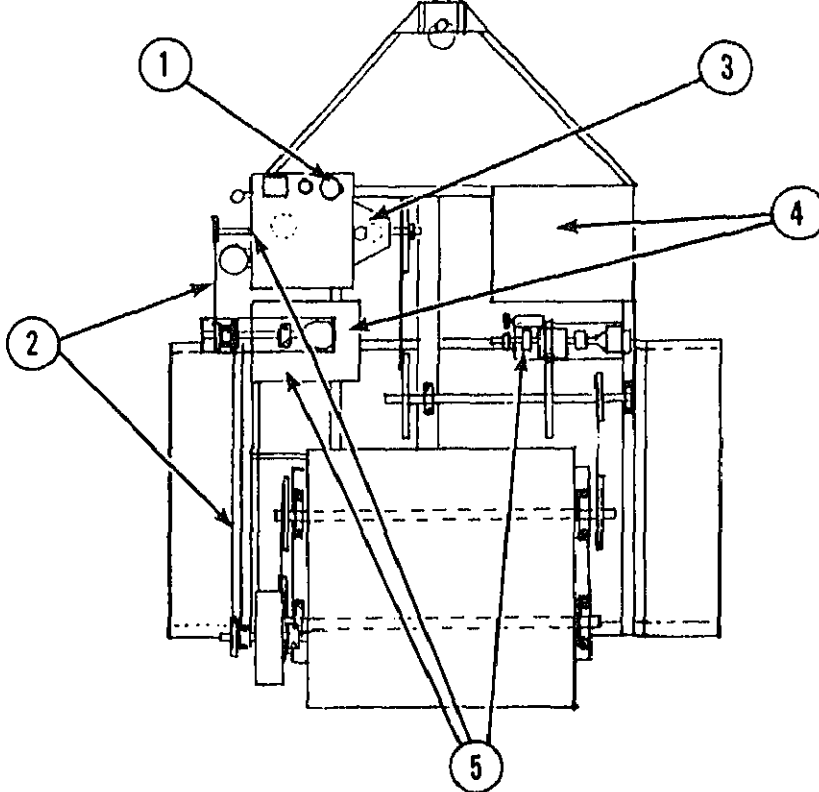
and described in paragraphs 3-6 and 3-7. numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of unit shall be noted for correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noticed which would damage equipment if operation were continued. All deficiencies and shortcomings will be recorded together with the corrective action taken. Refer to DA Form 2404 at the earliest possible opportunity.

3-6. Daily Preventive Maintenance Services

This paragraph contains, as illustrated, a tabulated listing of preventive maintenance services which must be performed by the operator. The item numbers are listed consecutively to indicate the sequence of minimum requirements. Refer to figure 3-5 for the daily preventive maintenance services.

3-7. Quarterly Preventive Maintenance Services

a. This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by organizational maintenance personnel at quarterly intervals. A quarterly interval is equal to 840 calendar months, or 250 hours of operation, whichever occurs first.



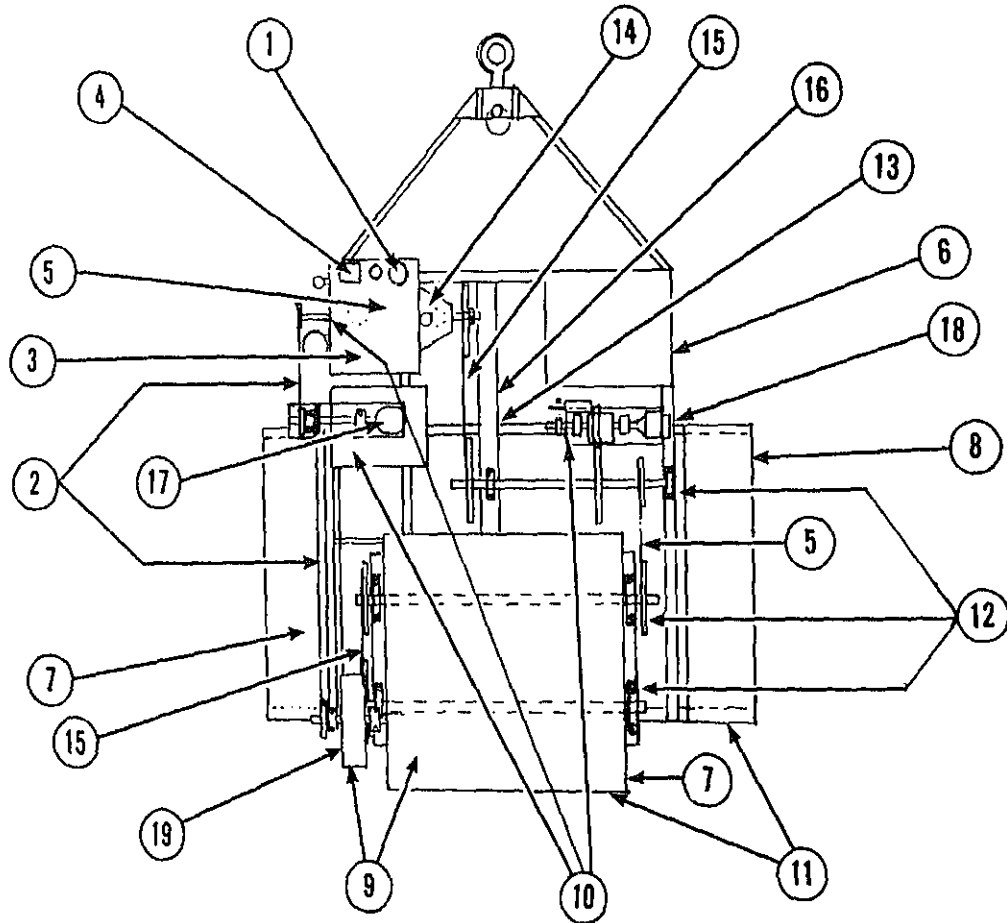
LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM		PAR REF
1.	<u>OIL LEVEL GAGE:</u> Add oil indicated by level gage	
2.	<u>FUEL OIL PUMP & BLOWER BELTS:</u> Proper adjustment is a deflection not greater than one inch midway between pulleys.	3-12
3.	<u>FUEL FILTER:</u> Tighten thumb nut if leaking (clean weekly)	3-44
4.	<u>FUEL OIL & GASOLINE:</u> Fill fuel oil and gasoline tanks.	
5.	<u>CONTROLS & INSTRUMENTS:</u> Inspect for damage and loose mounting, with the unit operating check for proper operation	2-9
6.	<u>Note 1: OPERATIONAL TEST:</u> During operation observe for any unusual noise or vibration.	

MEC 3895-283-15/3-5

Figure 3-5. Daily Preventive Maintenance Service.

QUARTERLY



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM	PAR
1.	See 1, Daily
2.	See 2, Daily
3.	SPARK PLUGS: Replace spark plugs that have cracked insulators or burned electrodes. Clean and set spark plug gap for 0.030 inch. Torque spark plugs to 30 foot-pounds. Replace leads which are frayed or broken. Clean and tighten lead connections.

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4.	MAGNETO: Replace pitted or burned magneto points. Proper point gap adjustment is 0.015 inch. (Check adjustment every 500 hours)	3-38
5.	FUEL FILTER: Clean filter element. Replace defective filter.	3-12
6.	FUEL TANKS: Tighten loose mounting. Replace a leaking fuel tank. Replace a defective cap gasket.	
7.	FIRE EXTINGUISHERS: Inspect for full charge. Do not discharge contents. Inspect for corrosion and insecure mounting.	2-15
8.	TIRES AND WHEELS: Correct tire pressure is 50 psi. Inspect for excessive wear, cuts, breaks, embedded foreign matter and missing valve caps. Tighten lug nuts.	3-65
9.	BURNER VALVES AND BURNERS: Clean and inspect for leaks, damaged and missing parts. Replace defective or missing parts.	3-11 3-48 3-49
10.	See 5. Daily	2-9
11.	TAIL, STOP, AND BLACK OUT LIGHTS: Inspect for burned out lamps and loose or missing parts. Inspect wiring for damage and loose electrical connections.	3-10
12.	SHAFTS AND BEARINGS: Inspect for excessive wear, insecure mounting, and loose or missing parts.	4-4E
13.	BRAKE MASTER CYLINDER: Check fluid level, reference L05-3895-283-12 Inspect for leaks and insecure mounting. Clean filler cap vent.	3-59
14.	ENGINE CLUTCH: Inspect for improper operation. Adjust as necessary.	3-46
15.	DRIVE CHAINS: Inspect for wear, defects, damage, and adjustment. Replace defective chains.	
16.	AIR CHAMBER: Inspect for insecure mounting and leaks. Drain condensate.	3-59
17.	FUEL OIL PUMP: Clean screen. Inspect for leaks. Replace a defective pump.	4-4D 7-6
18.	ASPHALT PUMP, CLUTCH, AND COUNTER: Inspect for leaks, wear, defects, damage, and adjustment. Adjust clutch as necessary.	3-52 4-4C

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19.	BLOWER: Inspect for wear, damage, and insecure mountin. Replace defective blower.	3 7
NOTE 1: See Note 1 Daily		
NOTE 2: ADJUSTMENTS. Make all necessary adjustments during operational test.		

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Figure 3-6③—Continued.

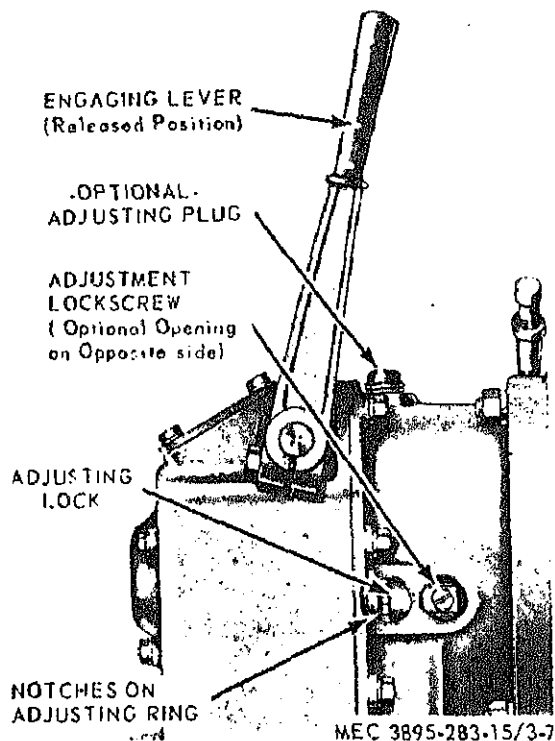


Figure 3-7. Clutch Reduction Unit.

b. The item numbers are listed consecutively and indicate the sequence of minimum require-

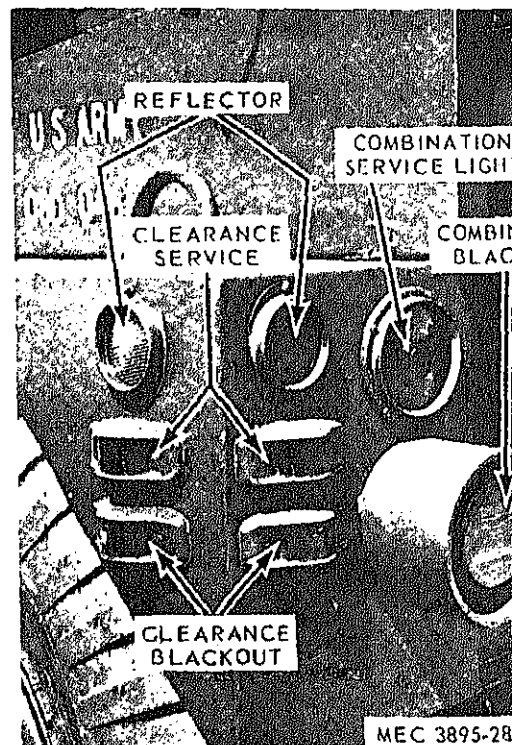
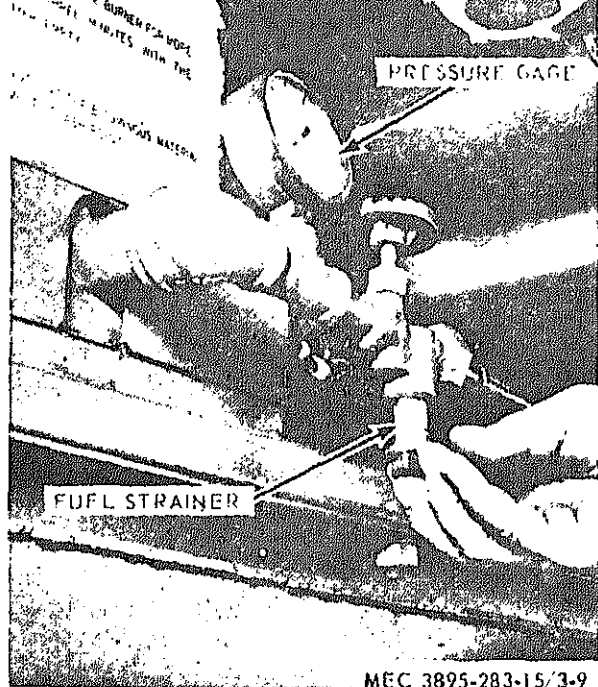


Figure 3-8. Fender View Showing Light Arrows. Refer to figure 3-6 for the q preventive maintenance services.



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Figure 3-9. Strainer Valve.

3-8. General

Instructions in this section are published for the information and guidance of the operator to maintain the drier-mixer.

3-9. Engine Assembly

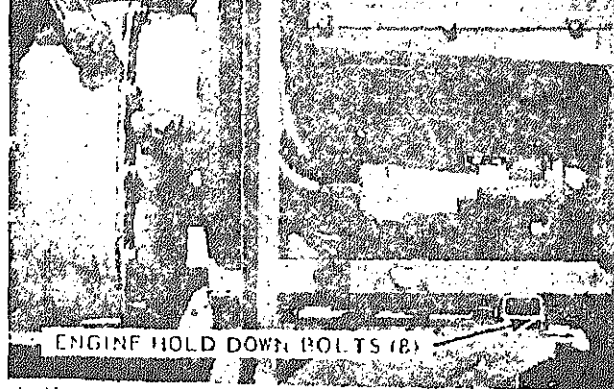
a. *Clutch Reduction Unit Adjustment.* Refer to paragraph 3-46 and figure 37 for clutch adjustment.

b. *Carburetor Adjustment.* The main metering jet in the carburetor is of the fixed type and requires no adjustment. The idler needle is located above the fuel inlet line and should be adjusted for best low speed operation while the throttle is closed by hand.

3-10. Lamps (fig. 3-8.)

a. *Clearance and Blackout Clearance Lamps.* Remove the two screws holding the cover assembly to housing. Remove the cover and replace bulb.

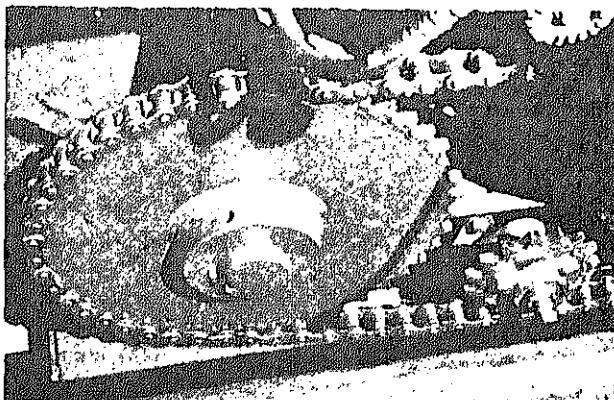
b. *Combination Service.* Remove the four screws holding the lens. Remove lens and gas-



A. Engine Base

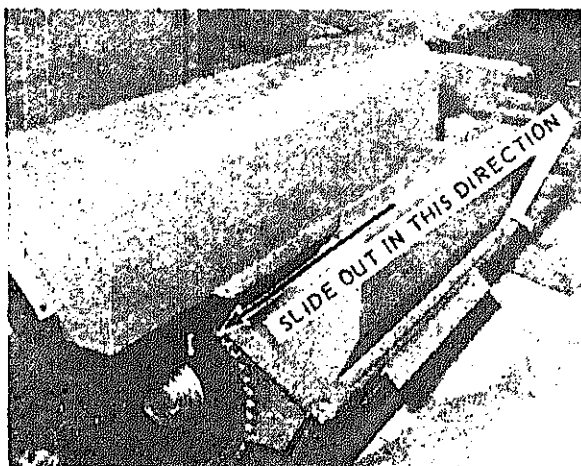


B. Asphelt Pump Drive Chain Tightener

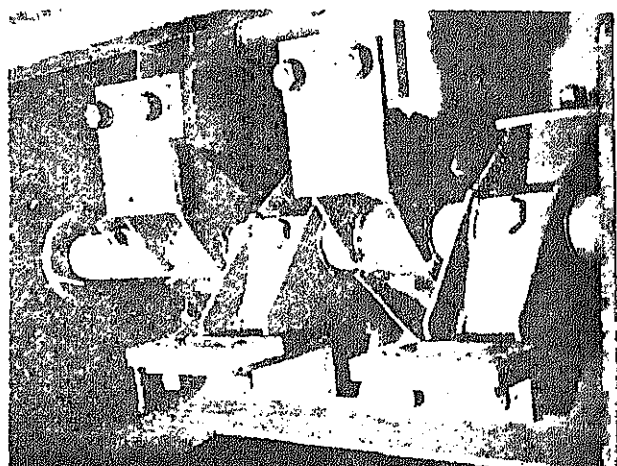


C. Mixing Shaft Drive Chain Tightener

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A. Burner Being Removed.



B. Paddle Tips on Paddles

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Figure 3-11. Burner.

3-11. Burner Strainer Valves

- Remove strainer from valve housing (fig. 3-9).
- Clean screen.
- Replace gasket and screen as required.
- Insert back into valve housing.
- Check for leaks.

3-12. Fuel Oil and Blower Belts Adjustments

- Remove guard.

3-13. Chain Tightness (fig. 3-10)

- Main Drive Chain Adjustment.** Loosen four hold down bolts on engine. Slide engine toward the front of the mixer to tighten, toward the rear to loosen. Tighten the hold down

bolts once the engine has been located for the desired adjustment.

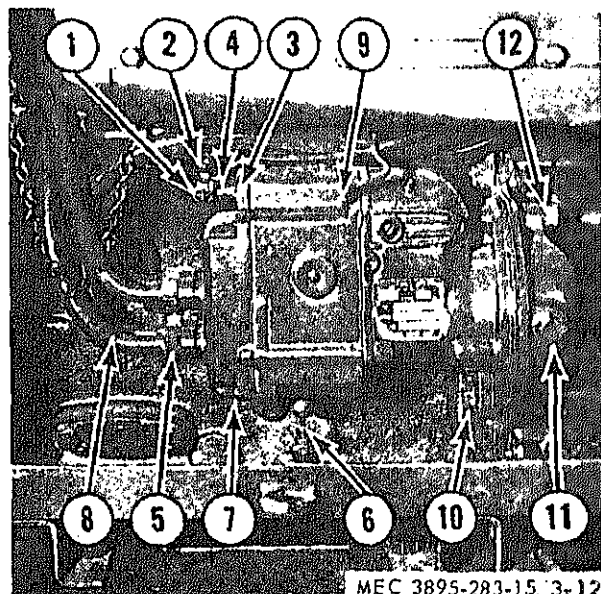
- Asphalt Pump Drive Chain Adjustment.** Loosen screw in idler and slide sprocket to tighten chain. Tighten idler screw.

- Mixing Shaft Drive Chain Adjustment.** Loosen screw in idler and slide sprocket to tighten chain. Tighten idler screw.

3-14. Pugmill Paddle Tips Replacement

- Remove blower (para -350).
- Remove pugmill burner (para 3-55).
- Working through the opening provided by the removal of the burner, remove the two flat-

- Remove excess links to increase tautness when deflection is greater than one (1) inch.
- Replace guard.



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- Screw
- Stop Switch Wire
- Screw (2 req'd)
- Capacitor
- No. 1 Tower
- Ground Switch
- Screw (4)
- Spark Plug Wire (4)
- Bonding Strap

3-15. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the drier-mixer and its components. Each trouble symptom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any trouble beyond the scope of Organizational Maintenance shall be reported to direct support maintenance.

3-16. Engine Hard to Start or Fails to Start

<i>Probable cause</i>	<i>Possible remedy</i>
Lack of fuel	Fill fuel tank
Fuel shut-off valve closed	Open fuel shut-off valve
Fuel strainer stopped up	Service fuel strainer
Carburetor not choked sufficiently.	See Starting instructions (para 2-11b)
Carburetor flooded	Crank with choke open
Clogged fuel lines	Check for clogged lines
Defective carburetor	Adjust or replace carburetor (para 3-39)
Defective spark plugs	Clean and adjust or replace
Defective magneto ground	Replace switch
Defective magneto	Adjust points or replace magneto (para 3-38)
Ignition cables broken or disconnected.	Tighten or replace cables

3-17. Engine Misses or Runs Erratically

<i>Probable cause</i>	<i>Possible remedy</i>
Spark plug gap incorrect	Clean and adjust spark plugs.
Weak spark	See "Magneto Service Procedure and Testing" (para 3-38b).
Loose connections at ignition cables.	Tighten cables at magneto and spark plugs.
Magneto breaker points pitted or worn.	Replace breaker points (para 3-38c).
Water in gasoline	Drain and refill fuel tank.
Poor compression	Replace engine (para 3-34).
Carburetor flooding	Adjust or replace carburetor (para 3-39).
Governor spring hooked into wrong hole in lever.	Correct location of spring (para 3-45c).
Governor rod incorrectly adjusted.	Adjust governor rod (para 3-44c).

3-18. Engine Stops Suddenly

<i>Probable cause</i>	<i>Possible remedy</i>
Fuel tank empty	Fill fuel tank.
Water, dirt or gum in gasoline.	Drain and refill fuel tank.
Vapor lock in fuel line or carburetor due to using winter gas.	Drain and refill fuel tank.
Ignition trouble	See Magneto (para 3-38).
Engine scored or stuck due to lack of oil.	Replace engine (para 3-34).

3-19. Engine Fails to Stop

<i>Probable cause</i>	<i>Possible remedy</i>
Defective ignition switch	Replace switch.
Dieseling	Idle engine to cool lead deposits in cylinder head.

3-20. Engine Overheats

<i>Probable cause</i>	<i>Possible remedy</i>
Crankcase oil supply low	Add proper oil LO 5-3895-283-12.
Ignition spark timed wrong.	Time magneto (para 3-38c).
Low grade of gasoline	Drain and refill fuel tank.
Air shroud removed from engine.	Replace shroud (para 3-36).
Dirt between cooling fins on cylinder or heads.	Clean dirt from engine.
Restricted exhaust	Clean or replace exhaust piping.
Engine speed too low under load	Speed engine to 1800 rpm.

3-21. Engine Lacks Power

<i>Probable cause</i>	<i>Possible remedy</i>
Defective carburetor	Adjust or replace carburetor (para 3-39).
Defective spark plugs	Clean, adjust or replace spark plugs.
Defective magneto	Adjust contact points, time or replace magneto (para 3-38).
Defective intake manifold	Replace intake manifold (para 3-40).
Valves out of adjustment	Adjust valves (para 3-43).
Air cleaner plugged up	Clean air cleaner.

<i>Probable cause</i>	<i>Possible remedy</i>
Poor grades of gasoline or low octane rating.	Drain and refill with proper gasoline.
Engine operating under heavy load at low speed.	Speed engine to 1800 rpm.
Carbon or lead deposits in cylinder head.	Replace engine (para 3-39).
Worn or loose piston pin	Replace engine (para 3-34).

3-23. Engine Oil Consumption High

<i>Probable cause</i>	<i>Possible remedy</i>
Worn out piston rings	Replace engine (para 3-34).
Oil seal out	Replace engine (para 3-34).

3-24. Engine Backfires Through Carburetor

<i>Probable cause</i>	<i>Possible remedy</i>
Water or dirt in gasoline	Drain and refill fuel tank.
Engine cold	Allow engine to warm up before applying load.
Sticky inlet valves	Clean and adjust valves (para 3-43).
Spark plugs too hot	Replace spark plugs.
Hot carbon particles in engine.	Clean or replace heads (para 3-42).
Out of time	Correct timing.

3-25. Burners Inoperative—Fuel

<i>Probable cause</i>	<i>Possible remedy</i>
No fuel in tank	Fill burner fuel tank.
Strainer valve clogged	Clean strainer valve (para 3-11).

Burner fuel pump inoperative. Repair or replace pump (para 3-51).
 Burner fuel pump belt slipping. Tighten belt (para 3-50).

3-26. Burners Inoperative—Air

<i>Probable cause</i>	<i>Possible remedy</i>
Blower drive belt slipping.	Tighten belt (para 3-50).
Defective blower assembly	Replace assembly (para 3-50).

3-27. Asphalt Pump Fails to Pump Asphalt

<i>Probable cause</i>	<i>Possible remedy</i>
No asphalt in tank	Fill asphalt tank.
Asphalt not heated to proper temperature.	Heat asphalt to proper temperature (para 3-11d).
Valves not turned on	Turn on valves (para 3-11e).
Cold asphalt in pump and line.	Heat pump and lines.
Pump clutch slipping	Adjust pump clutch (3-52d).
Pump inoperative	Repair or replace (para 3-52).

3-28. Erratic or no Delivery of Asphalt Pugmill

<i>Probable cause</i>	<i>Possible remedy</i>
No asphalt in tank	Fill asphalt tank.
Valve closed	Open valve.
Pump fails to pump asphalt.	See paragraph 3-27.

Section VI. RADIO INTERFERENCE SUPPRESSION

3-29. Definitions

a. *Interference.* The term "Interference" as used herein applies to electrical disturbances in the radio frequency range which are generated by the drier-mixer and which may interfere with the proper operation of radio receivers or other electrical equipment.

b. *Interference Suppression.* The term "Interference Suppression" used herein applies to the methods used to eliminate or effectively reduce radio interference generated by the drier-mixer.

3-30. General Methods Used to Attain Proper Suppression

Essentially, suppression is attained by providing a low resistance path to ground for the stray currents. The methods as used herein include shielding the ignition and high-frequency

wires, grounding the frame with bolts and straps and using capacitors and resistors.

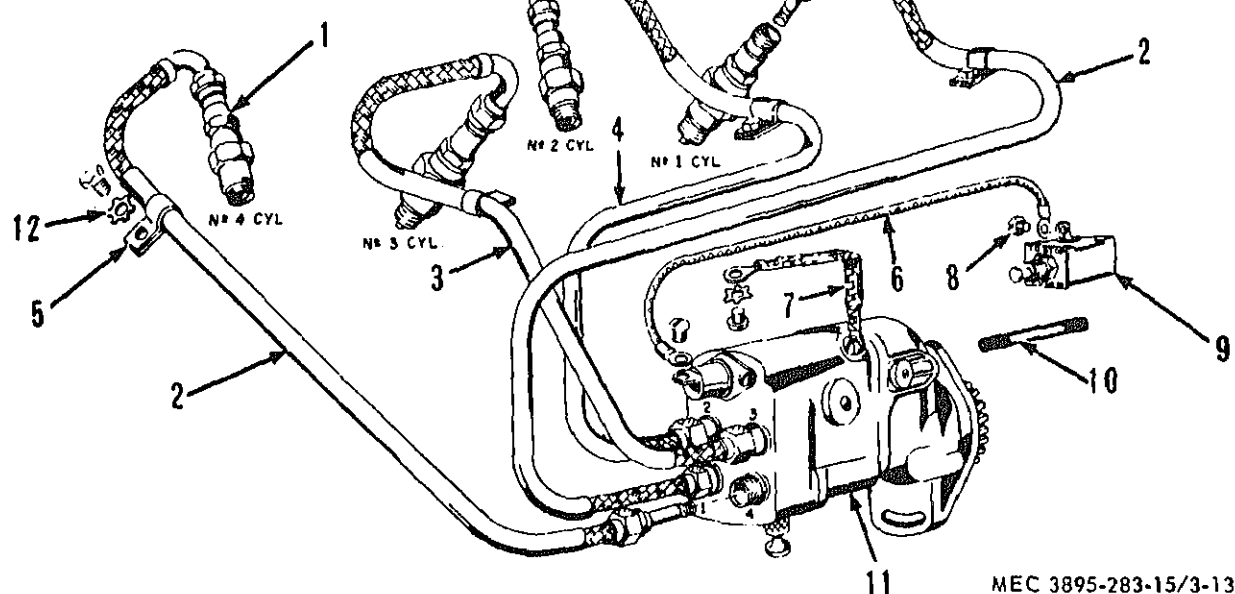
3-31. Interference Suppression Components

a. *Primary Suppression Components.* The primary suppression components are those whose primary function is to suppress interference. These components are mainly spark plug cables, spark plugs, cables, ground straps, and associated hardware.

b. *Secondary Suppression Components.* These components have radio interference suppression functions which are identical or secondary to their primary function.

3-32. Replacement of Suppression Components

Replacement of suppression components should be performed with parts identical to those being replaced. All shielding and



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- 1 Spark Plug
- 2 Wire Ignition
- 3 Wire, Ignition
- 4 Wire, Ignition
- 5 Clip
- 6 Ground Wire
- 7 Ground Strap
- 8 Screw, 1/4-20 x 3/8
- 9 Ground Switch Assy.
- 10 Stud, Mounting
- 11 Magneto, Radio Shield
- 12 Lockwasher, 1/4 Everlock, Ext.

Figure 3-13. Replacement of Shielded Ignition Cable.

must be exactly the same size and have the same micro-farad and voltage rating as in the original components.

a. Replacement of Magneto Capacitor.

- (1) Remove screw (1, fig. 3-12) and disconnect magneto stop switch wire.
- (2) Remove two screws securing capacitor.

(3) Position new capacitor and O ring in magneto and secure with two screws.

(4) Position magneto stop switch wire on capacitor terminal and secure with screw.

b. Replacement of Shielded Ignition Cables.

(1) Remove the cable hold-down clamp screw.

(2) Unscrew the spark plug terminal connector and the magneto terminal connector (fig. 3-13).

(3) Remove the cable from the engine.

(4) Remove the hold-down clamp from defective cable.

(5) Install new cable.

(6) Install new cable on engine by reversing steps 1 to 3.

3-33. Testing of Radio Interference Suppression Components

Test the capacitors for leaks and shorts on a capacitor tester; replace defective capacitors. If test equipment is not available and interference is indicated, isolate cause by the trial-and-error method of replacing each capacitor in turn until the cause of interference is located and eliminated.

3-34. Engine Removal From Machine

a. Removal From Machine.

- (1) Remove drive chain guard.
- (2) Remove master link from main drive chain and remove chain.
- (3) Remove cap screw holding strap to frame.
- (4) Disconnect engine fuel line strainer valve.
- (5) Remove belt guard and belt.
- (6) Remove four (4) engine holddown bolts.
- (7) Slide engine toward fuel oil pump and remove belt.
- (8) Lift engine from machine.

b. Installation of Engine.

- (1) To install engine, follow steps in section *a* in reverse order.
- (2) See paragraph 3-12 for drive belt adjustment.
- (3) See figure 3-10 for main drive chain adjustment.

3-35. Muffler and Exhaust Nipple

a. Removal.

- (1) Remove muffler, close nipple, lifting hook and adapter as illustrated in figure 3-14.
- (2) Remove engine canopy as illustrated in figure 3-15 and paragraph 3-36.
- (3) Remove exhaust nipple as illustrated in figure 3-15.

b. Cleaning and Inspecting.

Clean and inspect all parts. Replace gasket and damaged parts.

c. Installation

To install exhaust nipple and muffler, follow steps in section *a* in reverse order.

3-36. Sheet Metal Housing

a. Canopy.

(1) Removal.

- (a) Remove muffler and exhaust flange as illustrated in figure 3-14 and paragraph 3-35.
- (b) Remove the ten (10) screws holding the canopy in place, figure 3-15.
- (c) Remove canopy from engine.

- (2) *Replacement.* To replace canopy, follow steps in section *a* (1) in reverse order.



Figure 3-14. Muffler and Exhaust Nipple Removal.

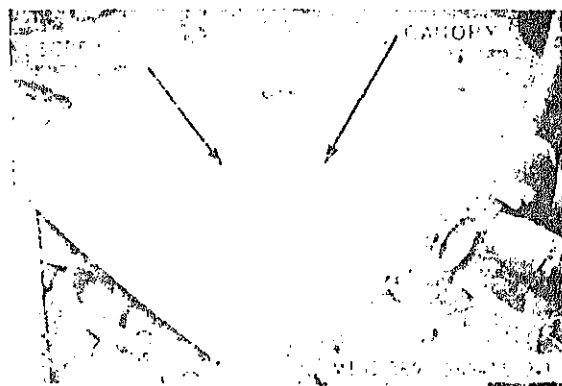


Figure 3-15. Canopy Removal.

b. Cylinder Baffles.

(1) Removal.

- (a) Remove the screws holding the cylinder heat deflectors in place. (fig. 3-16).
- (b) Remove deflectors from engine.
- (c) Remove the connectors from the spark plugs (fig. 3-16).
- (d) Remove the screws holding the cylinder head shroud in place. (fig. 3-16).
- (e) Remove the cylinder head shrouds from the engine.

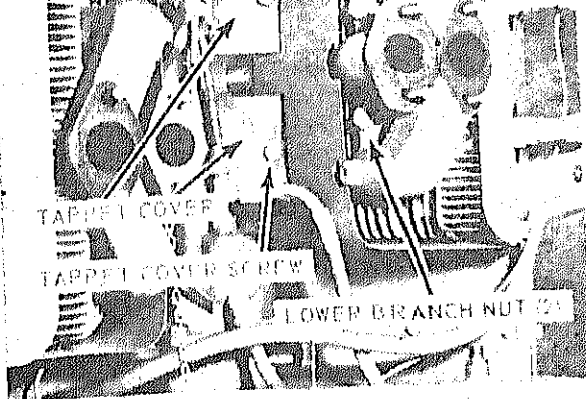
(2) Replacement.

- (a) Position the cylinder head shroud and heat deflector in place on the engine, start all screws in threaded holes. Tighten all screws.
- (b) Install connectors to spark plugs.

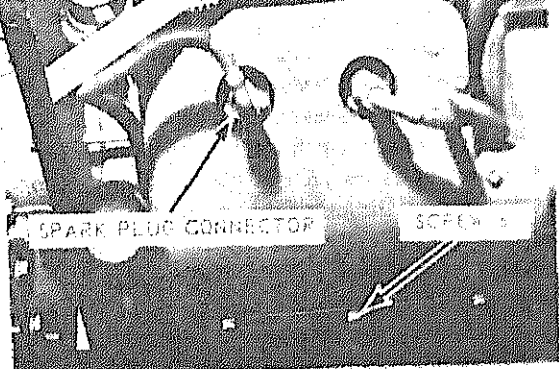
3-37. Intake and Exhaust Manifolds

a. Removal.

- (1) Remove the muffler and exhaust nip-



A. Heat Deflector



B. Cylinder Head Shroud Removal

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Figure 3-16. Cylinder Baffles Removal.

(2) Remove intake and exhaust manifold upper branch as illustrated in figure 3-17.

(3) Remove the intake and exhaust manifold lower branch as illustrated in figure 3-16.

b. *Cleaning and Inspecting.* Clean and inspect all parts. Replace damaged parts.

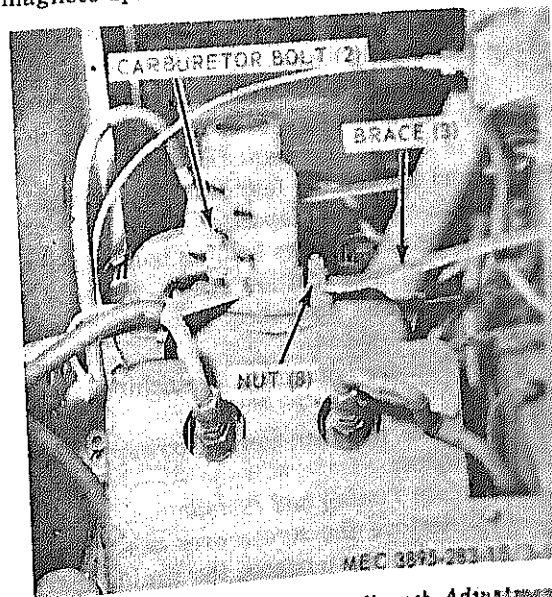
c. *Installation.* To install intake and exhaust manifolds, follow steps in section a in reverse order.

3-38. Magneto

a. *General Description.* The magneto is a special unit designed and built for use on the MVF-4D engine. This engine has a firing interval of 180° - 270° , 180° - 90° . The magneto having a four pole rotor and a four lobe cam, meets this requirement by producing four sparks per revolution of the rotor, which runs at crankshaft speed. In a complete cycle of two engine revolutions, four sparks are used for ignition and four fire in the exhaust. The magneto has a feed-through condenser, which eliminates the necessity of a shielded ground wire. The switch on the magneto is of the push button type and is held in either an open or closed position by a coiled spring.

b. *Service Procedure and Testing.* Improper functioning of the magneto is often believed to

be the cause of engine trouble arising from other sources. A brief engine inspection will often locate the trouble before the magneto is reached, and prevent maladjustment of the magneto parts in good condition. Open the magneto only when it is certain that the magneto ignition spark produced is unsatisfactory. This condition may be determined by a single magneto spark test easily made in the field



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Figure 3-17. Upper Exhaust Branch Adjustment

in placed out to the open position before any work is made.

(2) Remove the ignition cable from the tower (5, fig. 3-12) and in its place insert a short piece of stiff wire. Bend this wire so that it is not less than $\frac{1}{4}$ " from the magneto housing or the engine block. Turn the engine over slowly and watch carefully for the mark that should occur at the instant the impulse coupling releases. Repeat this procedure with the remaining towers. If a strong spark is observed from all the towers, it is recommended that the magneto be eliminated as the source of difficulty and that the cables, terminals and spark plugs be thoroughly inspected. If a weak or no ignition spark is noted, service the magneto.

c. Service of Breaker Points. The breaker points should be inspected for evidence of pitting or pyramiding. A small tungsten file or fine stone may be used to resurface the points. Replace badly worn or pitted points.

(1) Remove the four screws (7, fig. 3-12) and remove the cover.

(2) Use the hand crank and turn the engine until the rubbing block on the points is on the high side of the cam.

(3) Loosen the locking screws (fig. 3-18).

(4) Insert a screwdriver in the adjusting slot (fig. 3-18), and adjust breaker point gap to 0.015" at full separation.

(5) Tighten the locking screws and take final measurement of the breaker point gap after the locking screws are tightened.

(6) Clean the contact surfaces between the end cap and magneto frame. Place a new gasket in the joint, mount the end cap on the frame and tighten the four screws securely.

d. Replacement of Capacitor.

(1) Remove screws holding bonding strap (3, fig. 3-12) and ignition switch wires (2).

(2) Tag and disconnect spark plug wires (3).

(3) Remove magneto attaching bolts (4).

(4) Slide magneto toward power take-off end of engine.

e. Magneto Timing and Installation.

(1) Remove the screen over the flywheel or intake opening to expose the timing marks

on the flywheel. Turn the engine over by means of the starting crank until the leading edge of the marked vane on the flywheel is in line with the mark on the vertical center line of the shroud (fig. 3-19).

(3) Fit the magneto to the engine so that the X marked tooth on the magneto gear is visible through the lower half of the inspection hole in the timing gear housing (fig. 3-19).

(4) Install magneto by reversing steps in preceding paragraph D.

3-39. Carburetor

a. Removal.

(1) Remove the engine canopy as outlined in paragraph 56.

(2) Remove connector (1, fig. 3-20) and fuel line.

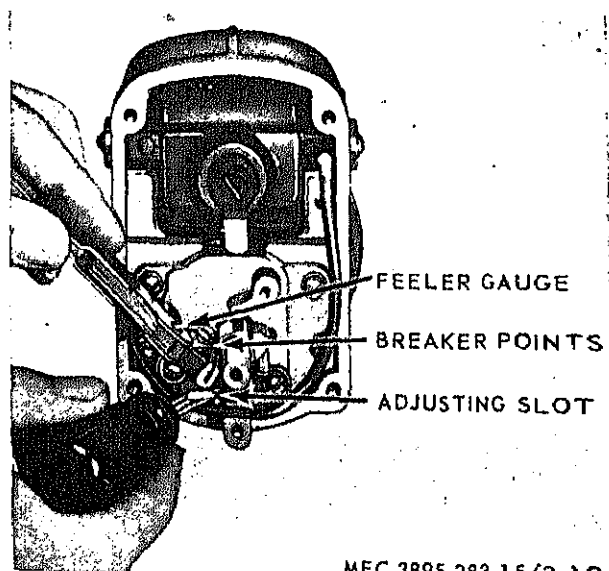
(3) Loosen hose clamps (2), and remove hose from carburetor.

(4) Loosen the lock screws (3) holding the choke control cable to the carburetor. Remove cable from choke arm.

(5) Remove control arm screws (4) on governor control arm. Pull rod from arm.

(6) Remove the two bolts (fig. 3-17).

(7) Remove carburetor from engine.



FIRING ORDER 1-3-4-2

EDGE OF VANE ON LINE WITH MARK ON
VERTICAL CENTERLINE

VERTICAL CENTERLINE
MARK ON SHROUD

*X MARKED VANE ON FLYWHEEL

CENTERLINE OF
NO 1 & 3 CYLINDERS

CENTERLINE OF
NO 2 & 4 CYLINDERS

NO 1 & 4 CRANKPINS

NO 2 & 3 CRANKPINS

GOVERNOR GEAR
CAMSHAFT GEAR
CRANKSHAFT GEAR

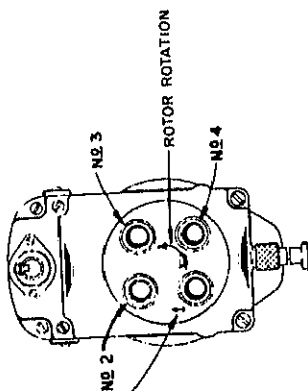
IDLER GEAR
MAGNETO GEAR

OIL PUMP GEAR

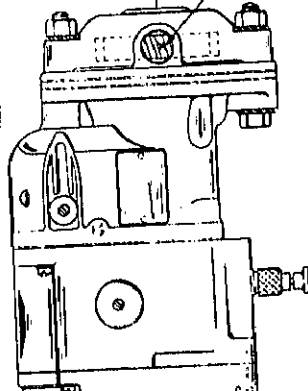
MARKED GEAR TOOTH VISIBLE
IN LOWER HALF OF TIMING
INSPECTION HOLE WHEN
THE FLYWHEEL IS LOCATED
AS INDICATED ABOVE.

RUNNING SPARK ADVANCE
FOR MAGNETO IGNITION.
FOR CHECK WITH
NEON LIGHT

1 TERMINAL LOCATED ON END
P AS SHOWN. OTHER TERMINALS
LOW IN A CLOCKWISE ROTATION



1 SWITCH
OR STARTING
STOP.



(1) Install new gasket and carburetor in position on intake manifold. Tighten bolts evenly to prevent cracking carburetor casting.

(2) Position the governor rod in control arm (fig. 3-20). Install lockwasher and nut.

(3) Insert choke control cable through choke lever. Move choke control lever to open position (away from instrument panel). Push choke cable in and tighten locking screw in choke lever.

(4) Install air inlet hose on carburetor and tighten the clasp.

(5) Replace canopy as outlined in paragraph 3-35.

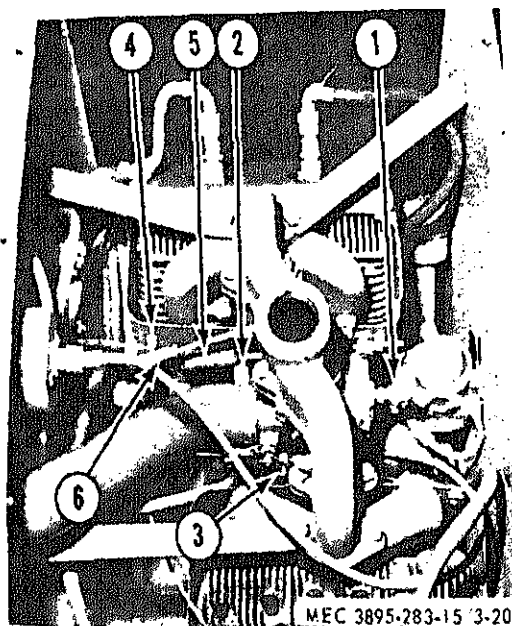


Figure 3-20. Removal of Carburetor.

3-40. Upper Manifold

a. Removal.

(1) Remove carburetor (para 3-39).

(2) Remove upper manifold as illustrated in figure 3-17.

b. Replacement.

(1) Install new gaskets.

(2) Reverse procedure in *a* above to replace upper manifold.

(3) Use a torque-indicating wrench and torque the upper manifold nuts to 14-18 foot-pounds.

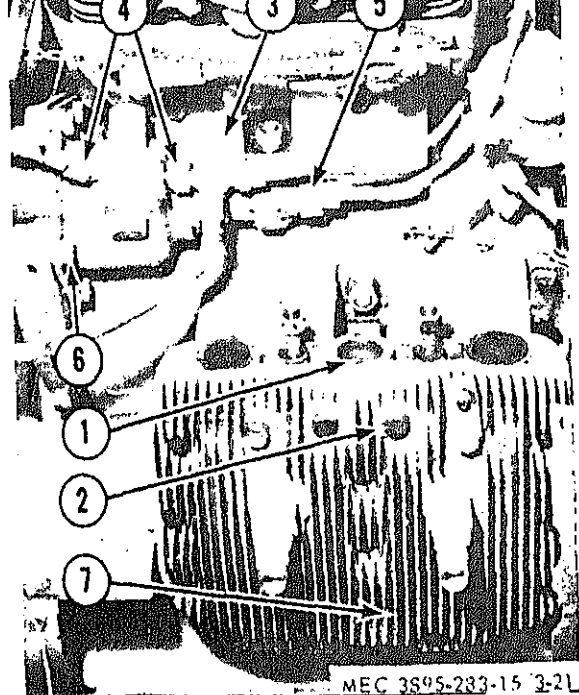


Figure 3-21. Cylinder Head Removal.

3-41. Lower Manifold

a. Removal.

(1) Remove upper manifold (para 3-40).

(2) Remove governor spring from lever (5, fig. 3-20).

(3) Remove cotter pin from control and drop chain from slot.

(4) Remove the two (2) nuts and lockwashers (fig. 3-19) holding the manifold to the cylinder.

(5) Remove lower manifold.

b. Replacement.

(1) Install new exhaust and inlet port gaskets (1, fig. 3-21).

(2) To replace the lower manifold, follow the steps in section *a* above in reverse order. Torque the manifold hold-down nuts to 14-18 foot-pounds.

3-42. Cylinder Head

a. Removal.

(1) Remove upper manifold as outlined in paragraph 3-40.

(2) Remove the cylinder baffles as outlined in paragraph 3-36.

fig. 3-21).

(4) Remove the cylinder head from engine.

b. Replacement.

(1) Clean all carbon, lead deposits and mud or rocks from between cooling fins of cylinder head.

(2) Install new cylinder head gasket.

(3) Use a mixture of graphite and oil on the cylinder head bolts to prevent the screws from rusting to cylinder block. Screws of different lengths are used and are to be assembled according to the various lengths of cylinder bosses.

(4) Tighten cylinder head screws with 22 to 24 foot-pounds of torque.

(5) Replace cylinder baffles (para 3-36).

(6) Replace upper manifold as outlined in paragraph 3-40.

(7) Retorque head screws after complete assembly and run-in of engine.

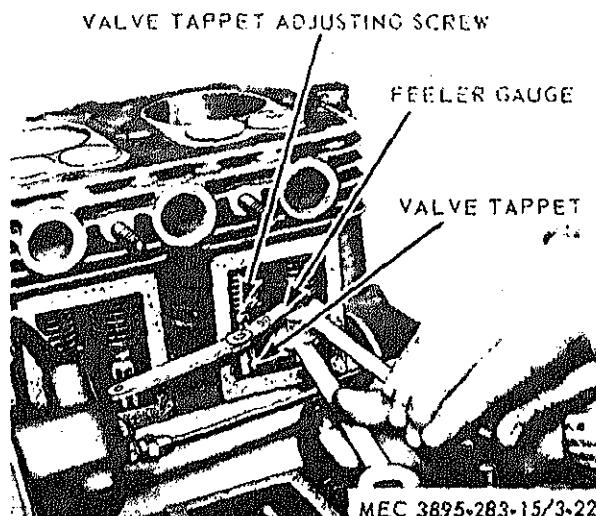


Figure 3-22. Valve Tappet Adjustment.

3-43. Valve Tappet Adjustment

a. Remove cylinder heads as outlined in paragraph 3-41.

b. Remove valve tappet inspection plates (8, fig. 3-21) from cylinder block.

c. Adjust the valve tappets as shown in figure 3-22.

d. With the tappets in their lower position.

cylinder block and valve tappet inspection plates.

f. Install new gasket and tighten inspection plates.

g. Replace cylinder heads as outlined in paragraph 3-42.

3-44. Fuel Pump

a. Removal.

(1) Remove fuel filter illustrated in figure 3-23.

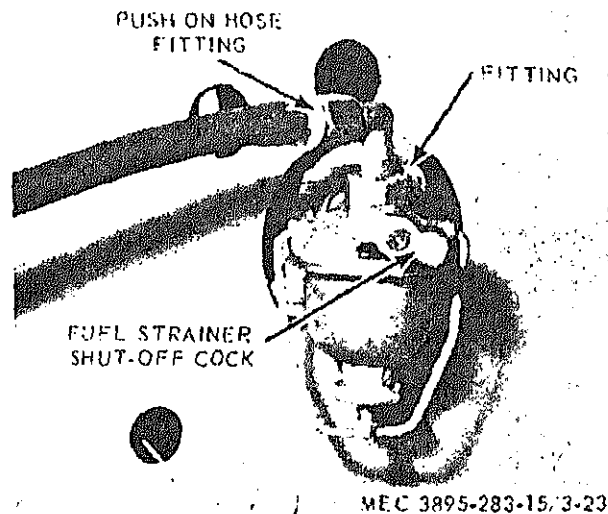


Figure 3-23. Fuel Filter Removal.

LOAD R.P.M.	NO LOAD R.P.M.	HOLE NO.	GOVERNOR LEVER	
1400	1525	4		HOLE NO.
1500	1650	5		12
1600	1725	5		11
1700	1850	6		10
1800	1950	7		9
1900	2025	7		8
2000	2150	8		7
2100	2225	8		6
2200	2350	9		5
2300	2425	9		4
2400	2550	10		3
				2
				1

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(2) Remove upper manifold as outlined in paragraph 3-40.

(3) Remove the two screws holding the fuel pump to the primer assembly (fig. 3-16).

(4) Remove the fuel pump.

b. Replacement.

(1) Remove pipe and tubing fittings from the old fuel pump and install in the same position on the new fuel pump.

(2) Replace the fuel pump adapter gasket and install the fuel pump.

(3) Replace the upper manifold as outlined in paragraph 3-40.

(4) To replace fuel filter, follow the steps in section *a* above in the reverse order.

(5) Prime the carburetor.

c. Carburetor Primer. This primer is equipped with a fuel primer. When starting an engine that has been out of operation for a while, the fuel primer linkage should be used to pump gasoline to the dry carburetor. When priming, a distinct resistance of the fuel pump diaphragm should be felt when moving the control button back and forth. If no resistance is felt, the engine should be turned over one revolution so that the fuel pump cam will be rotated from its upper position, which should prevent priming. This control should be given about 20 to 30 strokes, depending upon how much fuel, if any, there is in the carburetor

flat chamber. When the carburetor is full, the hand primer linkage will move more easily.

3-45. Engine Speed Governor

a. Removal.

(1) Remove upper manifold as outlined in paragraph 3-40.

(2) Remove oil lines (4, fig. 3-21) from governor.

(3) Loosen adaptor nut (5) and remove tachometer drive.

(4) Remove screws (6).

(5) Pull governor assembly from engine. Take care not to damage gear when removing governor.

b. Replacement.

Reverse procedure outlined in section *a* above to replace governor.

c. Adjustment.

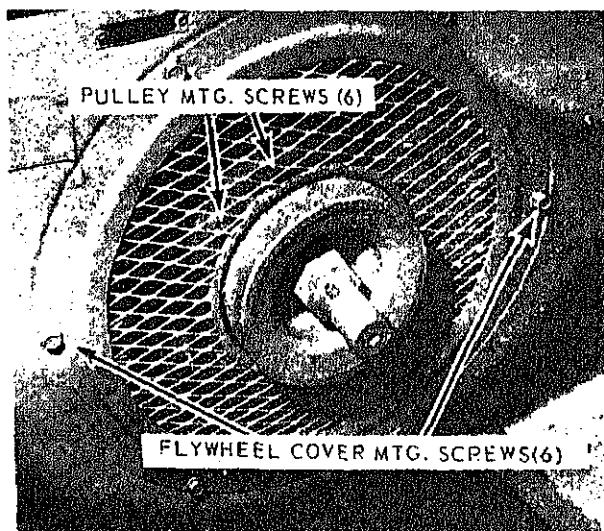
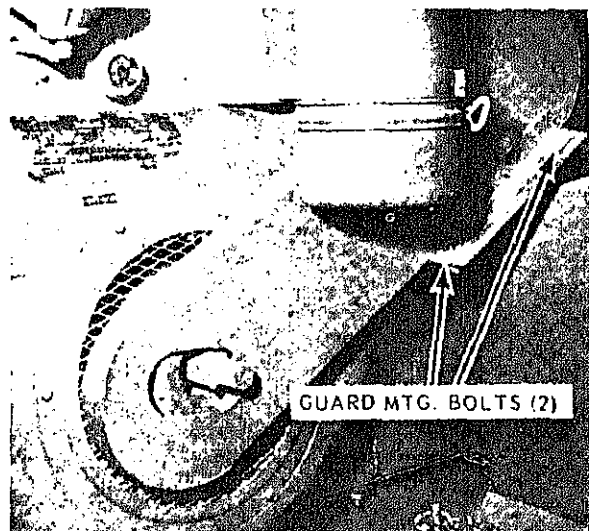
(1) Disconnect the control rod ball joint from the governor lever (6, fig. 3-10).

(2) Push the rod assembly toward the carburetor as far as it will go, opening the throttle.

(3) Move the governor lever as far as it will go in the same direction.

(4) Holding both parts in this position, screw the ball joint on the control rod until the stud registers with the hold in the lever.

(5) Screw the ball joint on to the control two more turns. This will provide clearance be-



tween the lever and stop pin, preventing excessive wear on the threads of the ball joint and control rod.

(6) Insert ball joint into hole in control lever, assemble and tighten lock nuts.

(7) The governor lever is furnished with 12 holes, (fig. 3-24) for attaching the governor spring. It is very important that the spring is hooked into the proper hole to suit the speed at which the engine is operated.

(8) The load rpm of the engine should be 1800 rpm. Hook the spring into hole No. 7.

(9) Use tachometer on engine and adjust the tension on the spring by means of adjusting screw hooked to the spring.

(10) Adjust no load rpm to 1950.

3-46. Clutch Adjustment

a. Remove the two pipe plugs on the side of the reduction unit, (fig. 3-7).

b. Disengage the clutch and turn the engine over slowly with the starting crank until the adjustment lock screw is visible through the pipe plug opening nearest the engine.

c. Loosen the lock screw one full turn or

enough to relieve the tension of the lock against the notches on the adjusting ring.

d. Turn engine over slightly to expose notch on the adjusting ring.

e. Keep engine crankshaft from turning, insert a screwdriver through the pipe plug opening and turn the adjusting ring one notch at a time in the clockwise direction (view from take-off end) until a very firm pressure is required to engage the clutch with the lever.

f. When adjustment is complete, tighten adjusting lock screw and install pipe plugs.

3-47. Fuel Pump and Blower Drive Pulley

a. Removal.

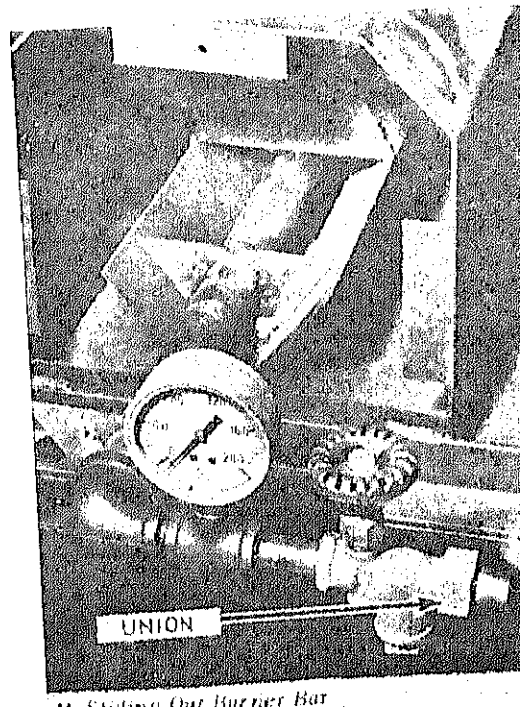
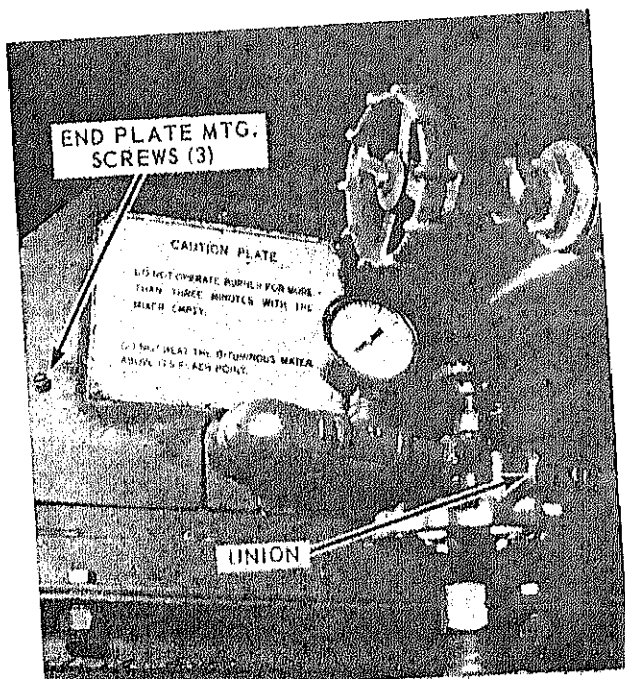
(1) Remove the drive belt guard (3-25).

(2) Remove the six screws holding flywheel to the cover (fig. 3-25).

(3) Remove the six screws holding blower drive pulley to the flywheel (fig. 3-25).

(4) Remove the pulley from flywheel.

b. Replacement. Reverse above procedure and install pulley.



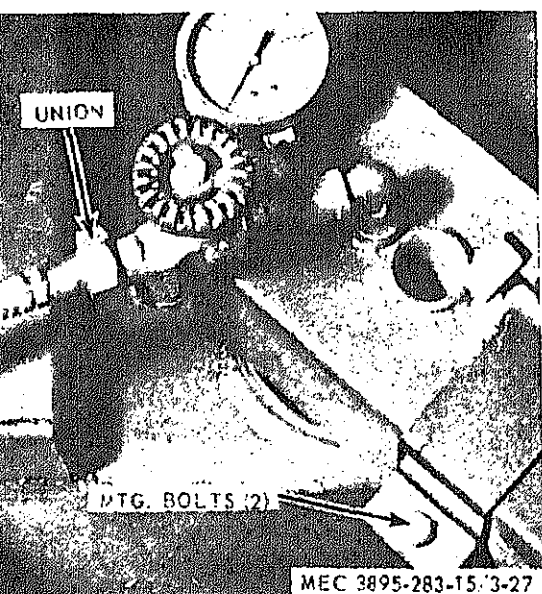


Figure 3-27. Asphalt Tank Burner Removal.

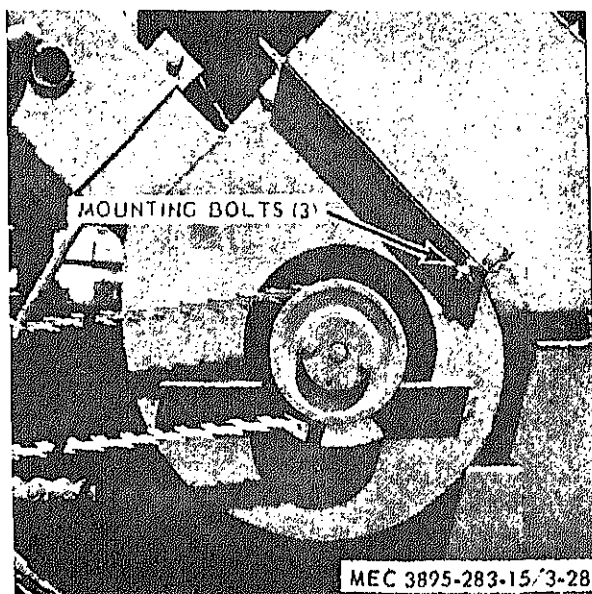


Figure 3-28. Blower Removal.

Section VIII. BURNER, BLOWER AND FUEL PUMP MAINTENANCE INSTRUCTIONS

3-48. Burner—Pugmill

a. Removal of the Burner Manifold Assembly.

- (1) Disconnect fuel line ahead of strainer valve (fig. 3-26).
- (2) Remove the three end plate screws (fig. 3-26).
- (3) Remove end plate and slide the manifold out (fig. 3-26).

b. Cleaning and Inspecting. Clean and inspect the nozzles, nozzle screens, valve and valve screen. Replace damaged parts.

c. Installation. Reverse steps in section a above to install the manifold assembly.

3-49. Burner—Asphalt Tank

a. Removal.

- (1) Disconnect fuel line ahead of strainer valve (fig. 3-27).
- (2) Loosen the two bolts holding the clamp and slide the clamp down on the blower extension.

b. Cleaning and Inspecting. Clean and inspect the nozzle, nozzle screen, air cone, valve, and valve screen. Replace damaged parts.

c. Installation. Reverse steps in section a above to install the asphalt take burner.

3-50. Blower

a. Removal.

- (1) Remove asphalt tank burner (para 3-49).
- (2) Remove drive belt.
- (3) Remove three screws mounting blower assembly (fig. 3-28).
- (4) Pull blower away.

b. Cleaning and Inspecting. Clean and inspect housing, cage, shaft, bearings, and pulley. Replace damaged parts. Lubricate bearings (LO 5-3895-283-12).

c. Installation. Reverse steps in section a above to install the blower.

3-51. Fuel Pump Unit

a. Removal of the Fuel Pump.

- (1) Disconnect fuel lines from pump (fig.

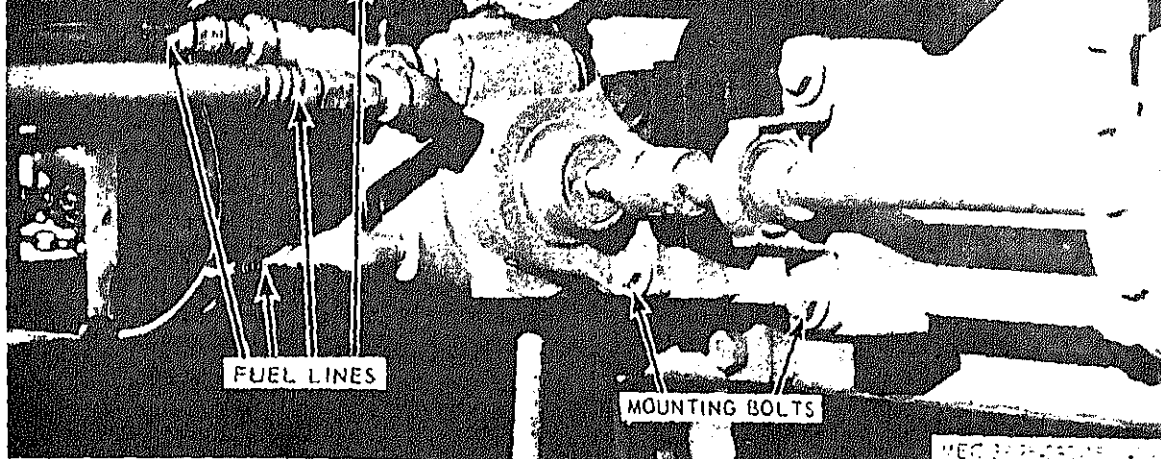
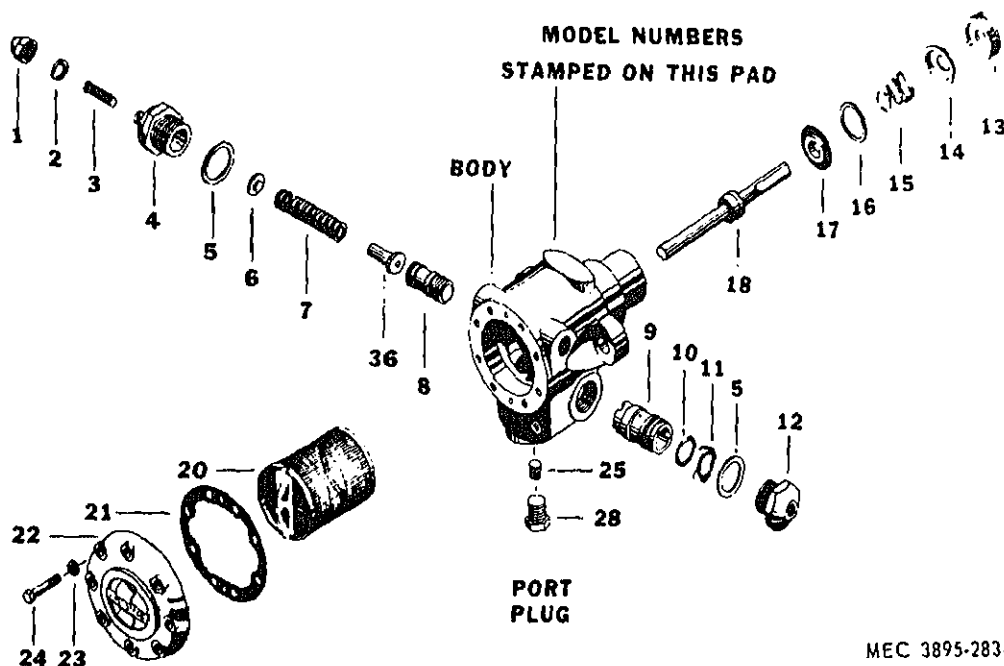


Figure 3-29. Fuel Pump Removal.



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- 1 End Cap Nut
- 2 End Cap Gasket
- 3 Pressure Adjusting Screw
- 4 Pressure Adjusting End Plug Assembly
- 5 End Plug Gasket
- 6 Spring Seat
- 7 Pressure Adjusting Spring
- 8 Piston Assembly
- 9 Piston Sleeve
- 10 "O" Ring
- 11 Sleeve Retainer
- 12 Nozzle End Plug Assembly
- 13 Seal Cap
- 14 Seal Cap

- 15 Seal Spring
- 16 Steel Washer
- 17 Seal Assembly
- 18 Shaft Assembly
- 19 Body
- 20 Strainer
- 21 Cover and Spacer Gasket
- 22 Cover
- 23 Cover Screw Gasket
- 24 Cover Screw
- 25 Bypass Plug
- 26 Intake and Return Port Plug
- 27 Check Valve Assembly

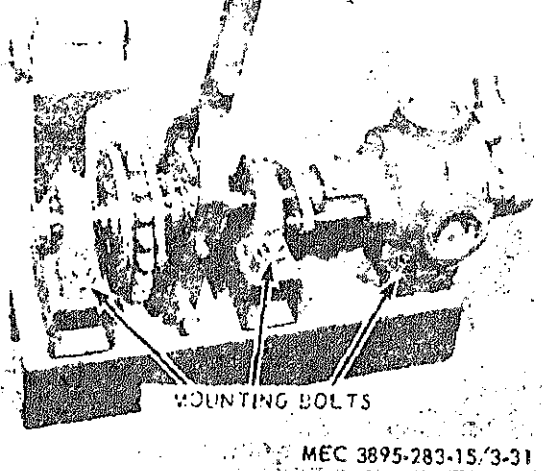


Figure 3-31. Asphalt Pump Removal.

mounting bracket.

(3) Slide pump off.

b. *Cleaning and Inspecting.*

(1) Disassemble pump, clean and inspect the parts. Replace all damaged parts (fig. 3-30).

(2) Install new gaskets and reassemble pump (fig. 3-30).

c. *Installation.* Reverse steps in section above to install the pump.

d. *Removal of Extension Shaft Unit.*

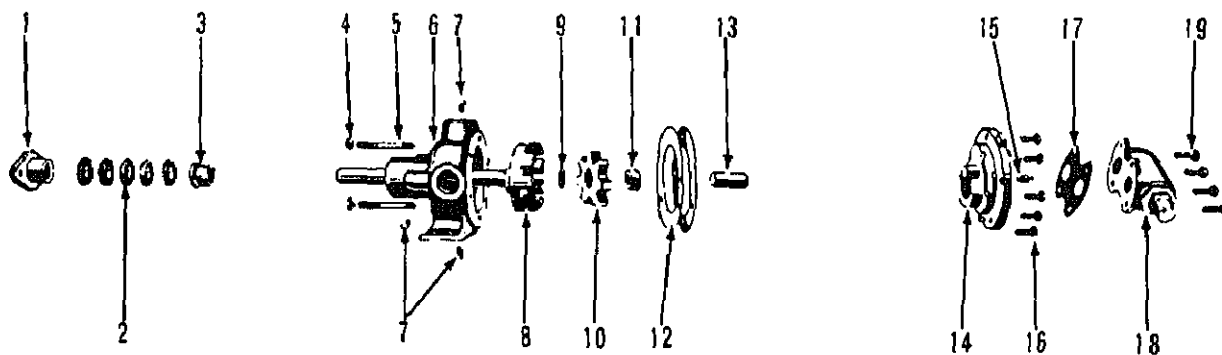
(1) Remove belts (fig. 3-29).

(2) Remove mounting screws (2 on each bearing).

(3) Lift off mounting base.

e. *Cleaning and Inspecting.* Clean and inspect shaft coupling, pulleys and bearing. Lubricate bearings. (LO 5-3895-283-12).

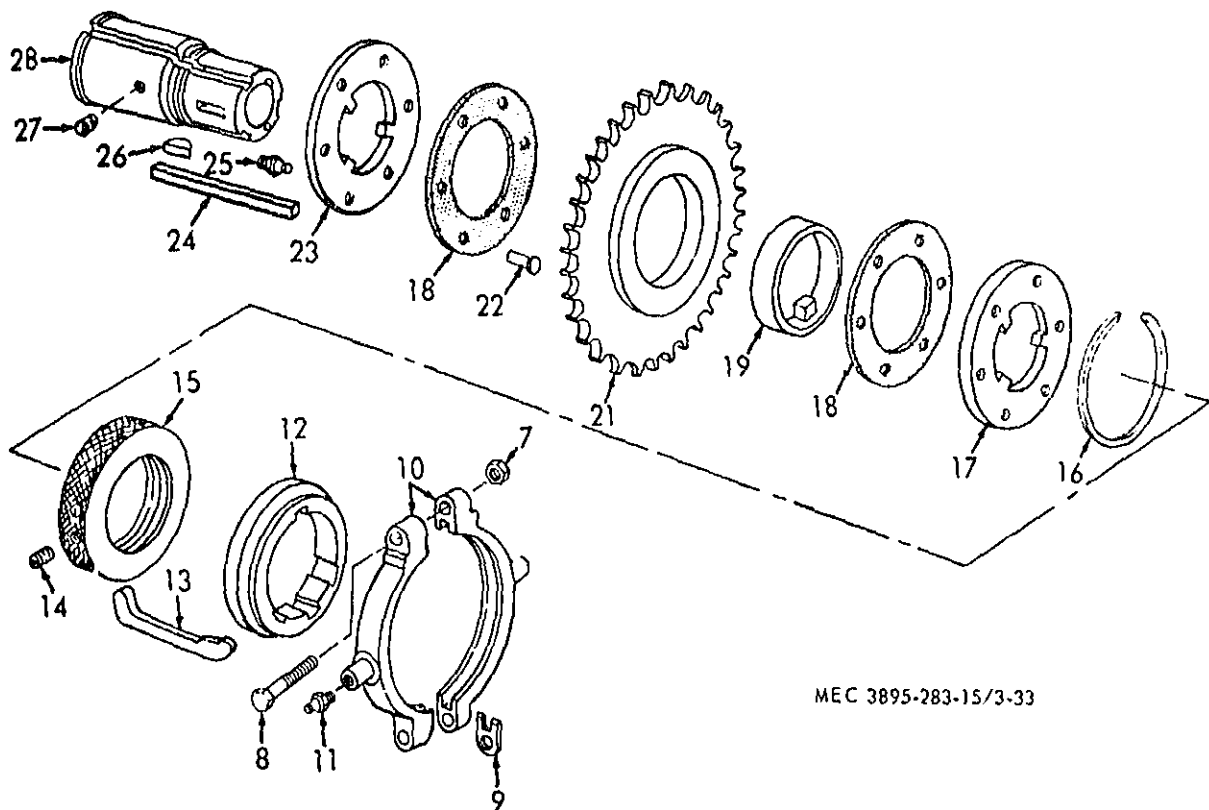
f. *Installation.* Reverse steps in section above to install the extension shaft.



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- 1 Packing Gland
- 2 Packing
- 3 Casing Bushing
- 4 Packing Gland Nuts
- 5 Packing Gland Studs
- 6 Casing
- 7 Pipe Plug
- 8 Rotor and Shaft
- 9 Idler Disc
- 10 Idler
- 11 Idler Bushing
- 12 Head Gasket
- 13 Idler Pin
- 14 Head
- 15 Grease Fitting
- 16 Cap screw
- 17 Gasket
- 18 Relief Valve
- 19 Cap screw

Figure 3-32. Exploded View of the Asphalt Pump Assembly.



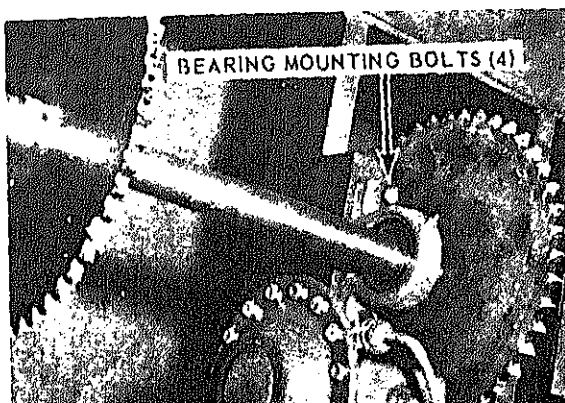
MEC 3895-283-15/3-33

- 7 Nut
- 8 Screw
- 9 Shims
- 10 Cone
- 11 Fitting
- 12 Sleeve
- 13 Lever

- 14 Screw
- 15 Ring
- 16 Key
- 17 Plate
- 18 Lining
- 19 Bearing
- 21 Sprocket

- 22 Rivet
- 23 Plate
- 24 Key
- 25 Fitting
- 26 Key
- 27 Screw
- 28 Hub

Figure 3-33. Exploded View of Clutch.



3-52. Pump, Clutch and Bearings

a. Asphalt pump, clutch and Bearings Removal.

- (1) Disconnect pipe couplings (fig. 3-31).
- (2) Loosen idler on drive chain.
- (3) Remove master link from chain and remove chain.
- (4) Remove drive belt to counter.
- (5) Remove eight mounting screws (4 pump base, 2 each bearing) and lift assembly from mounting base.

(6) Remove outside bearing, clutch and inside bearing from pump shaft.

b. Cleaning and Inspection. Clean and inspect the asphalt pump (fig. 3-32), clutch (fig. 3-33) and bearing. Replace all damaged parts.

c. Installation. Reverse steps in section *a* to install asphalt pump, clutch and bearings.

d. Asphalt Pump Clutch Adjustment (fig. 3-33).

(1) Loosen screws on the adjustment collar.

(2) Tighten the clutch by turning adjustment collar clockwise until a definite center or snap of equipment can be felt on clutch lever.

(3) Loosen the clutch by turning adjustment collar counter clockwise until the snugness is removed.

3-53. Counter

a. Counter Removal.

(1) Remove drive belt to counter (fig. 3-31).

(2) Remove four (4) screws mounting counter to base.

(3) Lift counter from base.

b. Cleaning and Inspecting. Clean and inspect the drive belt and counters. Replace damaged belt and counter with new parts.

c. Installation. Reverse steps in section *a* above to install the counter.

Section X. JACK SHAFT MAINTENANCE INSTRUCTIONS

3-54. Jack Shaft

a. Removal of Jack Shaft (fig. 3-34).

(1) Loosen idler on drive chain to asphalt pump clutch.

(2) Remove master links from the above chains.

(3) Remove chains.

(4) Remove the four (4) bearing mounting screws.

(5) Slide shaft toward engine and remove from main drive chain.

(6) Lift jack shaft from the unit.

b. Cleaning and Inspecting. Clean and inspect chains, sprockets, bearings. Replace damaged parts.

c. Installation. Reverse steps in section *a* above to install jack shaft.

Section XI. COMBINATION DRYING AND MIXING CHAMBER

3-55. Pugmill Paddle and Paddle Tip

a. Removal of Paddle and Tips.

(1) Remove blower (para 3-50).

(2) Remove pugmill burner.

(a) Disconnect fuel line (para 3-48).

(b) Loosen and push up pipe running through pipe carrier on blower base.

(c) Remove four screws mounting burner base.

(d) Slide out burner unit.

(3) Remove tips to be replaced (para 3-44). Remove damaged paddles and tips.

the paddle mounting screw running through the mixing shafts.

b. Installation of Paddle and Tips. Reverse steps in section *a* above to install and/or paddle tips.

Note. When replacing paddles make sure paddles are facing the rear when they are in position.

3-56. Pugmill Liner

a. Removal of Liner.

liner.
(2) Remove eight (8) screws mounting

(3) Slide liner out (fig. 3-11).

d. *Installation of Liner.* Reverse steps in section a above to install the new liner.

Section XII. BRAKES (AIR/HYDRAULIC) MAINTENANCE INSTRUCTIONS

3-57. Service Brake

a. *Adjustment and Bleeding.*

Note. To determine when brakes require adjustment, check master cylinder and air chamber push rod travel. Do not adjust brake shoes when brakedrums are hot.

(1) *Adjustment.*

(a) Open drain cock on air reservoir.

Jack up axle so wheels may be rotated freely.

(b) Turn one of the shoe-adjusting cam studs on upper rear face of backing plate (fig. 3-35) to bring brake lining in contact with drum until brake drags slightly when wheel or drum is turned by hand. Back off adjusting cam stud just enough to allow wheel or drum to rotate freely.

(c) Repeat this procedure with other shoe-adjusting cam stud which is rotated in opposite direction to loosen and tighten. Adjust brakes to permit push rod travel $\frac{1}{2}$ inch minimum (para 3-59c). Cams have shoe-adjusting cam springs which lock them in set positions.

(d) Close drain cock on air reservoir and lower vehicle.

(2) *Manual bleeding.* Connect trailer braking system or manual bleeding operations as brake pedal on towing vehicle must be depressed and released to actuate system. The hydraulic master cylinder reservoir as shown in figure 3-36, must be kept full during bleeding operations.

(a) Clean bleeder valve (fig. 3-35), attach bleeder tube to the bleeder valve, and place end of tube in jar or bottle so that the end is submerged in hydraulic brake fluid.

(b) Fill reservoir with brake fluid as required on current Lubrication Order.

(c) Open bleeder valve by turning three-quarters of a turn counter-clockwise and depress brake pedal on towing vehicle to expel air which will show as bubbles in fluid coming out of tube.

(d) Repeat operation until air bubbles do not appear. Watch flow, keeping tube sub-

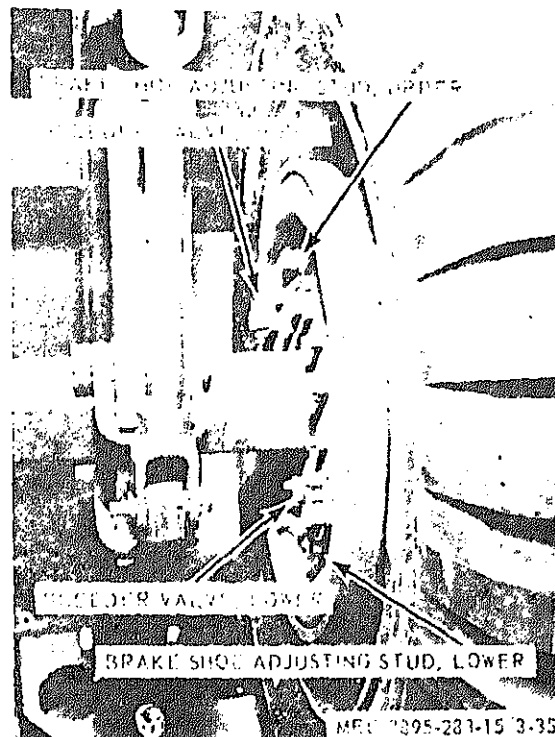


Figure 3-35. Brake Shoe Adjustment.

(e) When air bubbles cease and stream is clear, close bleeder valve firmly. Remove bleeder tube.

(f) Repeat above operation on other wheel cylinders. Install plug and vent in top of master cylinder reservoir.

b. *Removal of Brake Shoe With Linkage* (fig. 3-37).

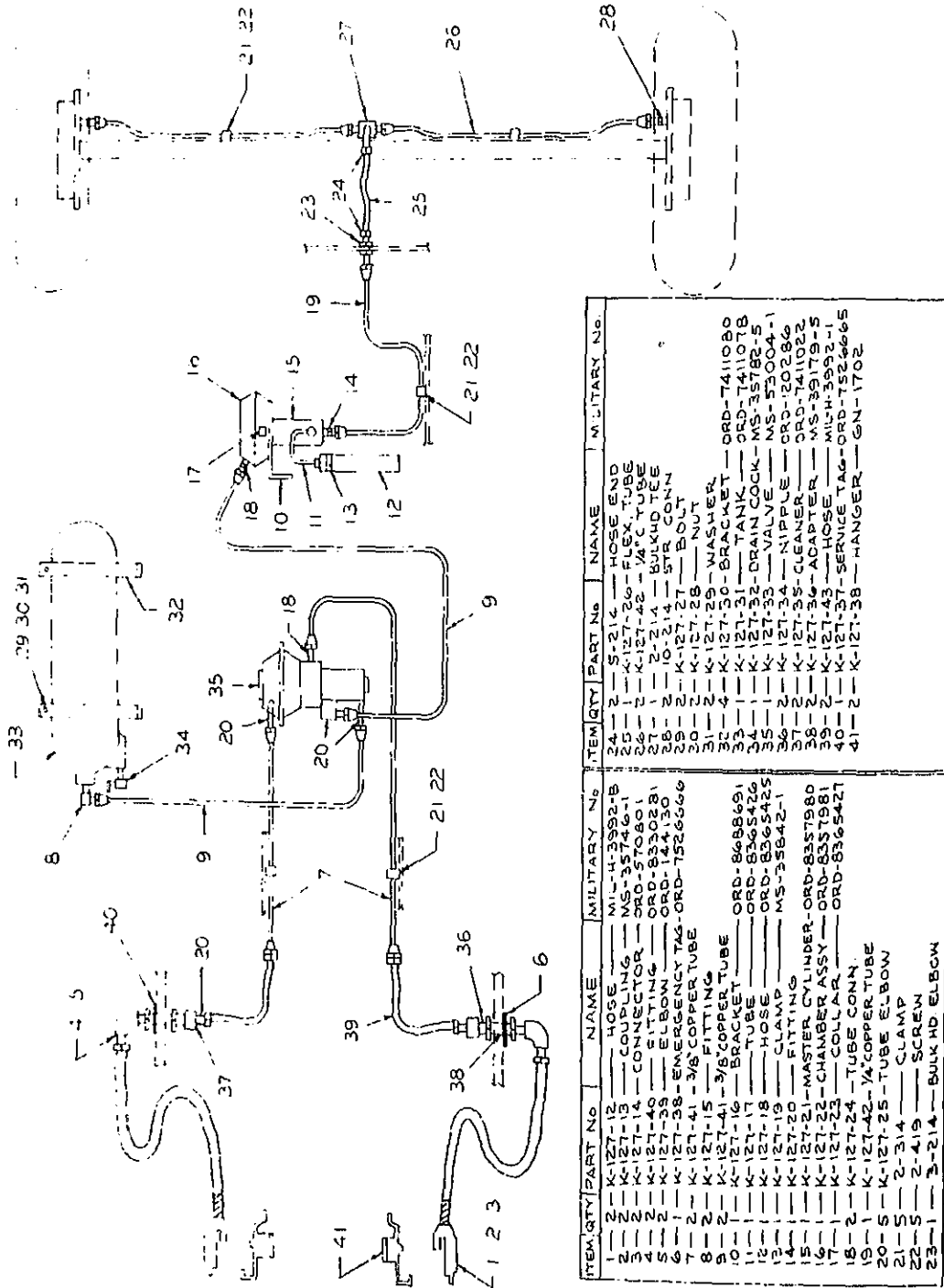
(1) Open air reservoir drain cock.

(2) Remove wheels, hubs and brake drum (para 3-66).

(3) Install clamp to retain pistons in the wheel cylinders.

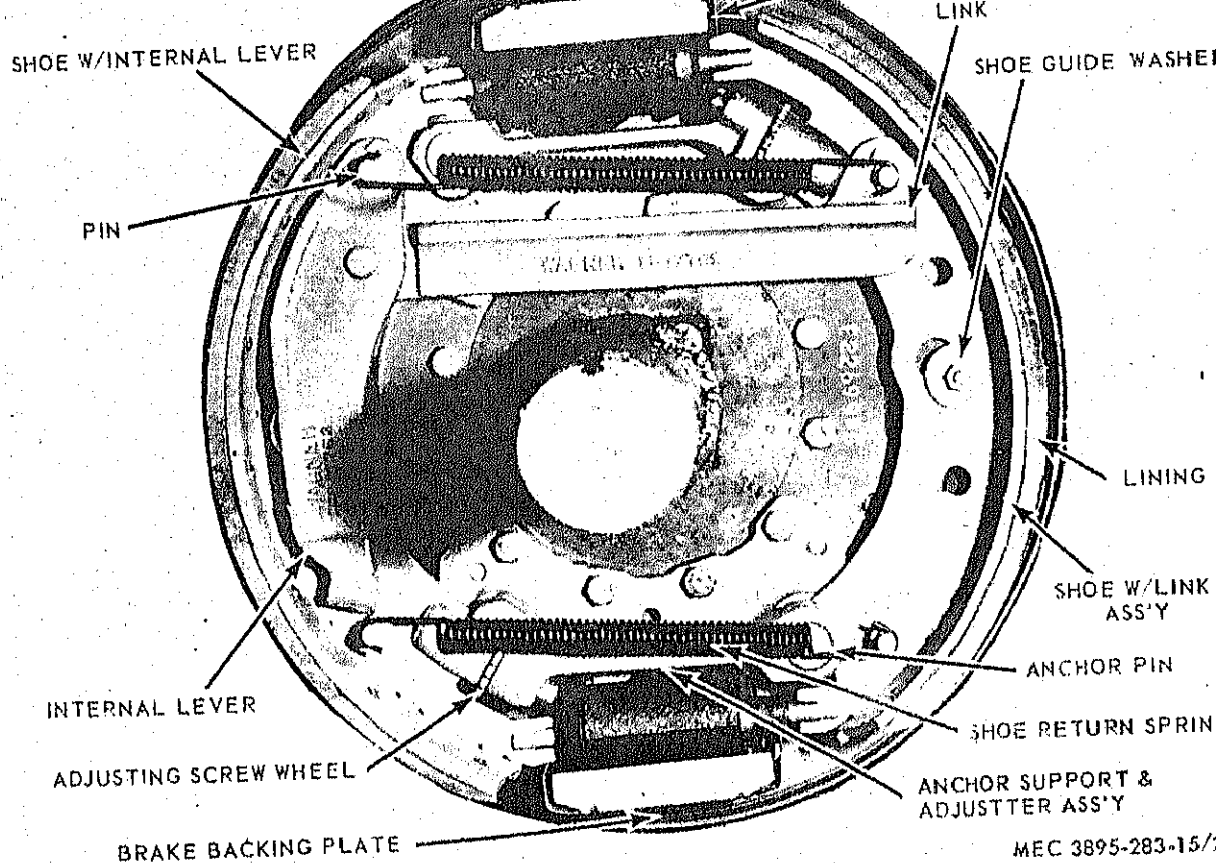
(4) Remove brake shoe return springs from front and rear shoes.

(5) Remove hex nut, guide bolt, lock-



ITEM	QTY	PART NO	NAME	MILITARY NO	ITEM	QTY	PART NO	NAME	MILITARY NO
1	2	K-127-12	HOSE	MS-43992-B	24	2	S-214	HOSE END	
2	2	K-127-14	COUPLING	MS-35746-1	25	1	K-127-26	FLX. TUBE	
3	2	K-127-16	BRACKET	ORD-86886-1	26	2	K-127-42	1/4" C. TUBE	
4	2	K-127-40	ELECTRIC	ORD-57080-1	27	2	S-214	BULKHEAD	
5	2	K-127-38	ELBOW	ORD-82450-1	28	2	K-127-27	ST. COIN	
6	1	K-127-38	EMERGENCY TAG	ORD-752666-6	29	2	K-127-27	BOLT	
7	2	K-127-41	3/8" COPPER TUBE		30	2	K-127-28	WASHER	
8	2	K-127-15	FITTING		31	2	K-127-30	BRACKET	ORD-741020
9	2	K-127-41	3/8" COPPER TUBE		32	2	K-127-31	TANK	ORD-741018
10	1	K-127-16	BRACKET	ORD-86886-1	33	1	K-127-32	DRAIN COCK	MS-3582-5
11	1	K-127-17	TUBE	ORD-836542-2	34	1	K-127-33	VALVE	MS-53004-1
12	1	K-127-18	HOSE	ORD-836542-2	35	2	K-127-34	PIPE	ORD-20286
13	1	K-127-19	CLAMP	MS-35842-1	36	2	K-127-35	CLEANER	ORD-741022
14	1	K-127-20	FITTING		37	2	K-127-36	ADAPTER	MS-35919-5
15	1	K-127-21	MASTER CYLINDER	ORD-8357980	38	2	K-127-43	HOSE	MS-35919-5
16	1	K-127-22	CHAMBER ASSY	ORD-8357981	39	2	K-127-37	SERVICE TAG	ORD-752666-5
17	1	K-127-23	COLLAR	ORD-8365421	40	1	K-127-38	HANGER	GN-1702
18	2	K-127-24	TUBE CONN.		41	2	K-127-38	HANGER	GN-1702
19	1	K-127-42	1/4" COPPER TUBE						
20	5	K-127-25	TUBE ELBOW						
21	5	S-214	CLAMP						
22	5	S-214	SCREW						
23	1	S-214	BULK HEAD ELBOW						

Figure 3-36. Air/Hydraulic Brake System.



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Figure 3-37. Brake Assembly.

sleeve, securing shoe with link assembly to brake backing plate. Simultaneously, lift shoe with link assembly off backing plate and away from wheel cylinder push rods.

c. Installation of Brake Shoe With Lining.

(1) Position shoe with internal lever assembly on brake backing plate. Slide top end of shoe to a position opposite clevis at end of wheel cylinder push rod. Rotate anchor pin in large opening of upper anchor support and adjust to aline cutout in pin with cutouts of pin and support. Slide lower end of shoe into cutout in cylindrical portion of installed lower anchor support and adjust to seat on face of adjusting screw.

(2) Position shoe with link assembly on brake backing plate, making certain forked end of link extending from shoe seats over pin

Follow installation procedures in above cure shoe with internal lever assembly to backing plate with bolt guide sleeve, guide shoe guide washer and lockwasher.

(3) Secure shoe with link assembly on brake backing plate, with capscrew, washer, shoe guide washer, and bolt sleeve.

Note. The $\frac{1}{4} \times 1$ capscrew will thread in to secure the connection of the lower cylinder tube assembly mounted on the rear of the brake backing plate.

(4) Install upper shoe return spring anchor pin in forward and rear

(5) Install lower shoe return spring anchor pin in forward and rear handbrake cable. Remove clamp.

(6) Install hub, brakedrum and (para 3-66).

(7) Adjust service brakes (para

(8) Bleed brake system.

(9) Close air reservoir drain cock (fig. 3-36).

3-58. Wheel Cylinder (fig. 3-37)

a. Removal.

(1) Remove brake shoe (para 3-57b).

(2) Disconnect intercylinder tube assembly at wheel cylinder on rear of brake backing plate.

(3) Remove cap screws and lockwashers securing each wheel cylinder spark shield and wheel cylinder to brake backing plate. Remove cylinders and shields from plate.

b. Installation.

(1) Position each wheel cylinder spark shield and wheel cylinder on backing plate. Secure each shield and cylinder to plate with 5/16 x 3/8 cap screws.

(2) Connect intercylinder tube assembly to each wheel cylinder. Connect hydraulic line to intercylinder tubes.

Note. Care should be taken to avoid bending or damaging hydraulic lines and cylinder tubes.

(3) Assemble brake shoes (para 3-57).

3-59. Hydraulic Brake Master Cylinder and Air Chamber Assemblies (fig. 3-36)

a. Removal.

Caution: Release air pressure from brake system before removing the master cylinder and/or air chamber assemblies.

(1) Disconnect air tube at air chamber.

(2) Disconnect hydraulic tube from hydraulic brake master cylinder assembly.

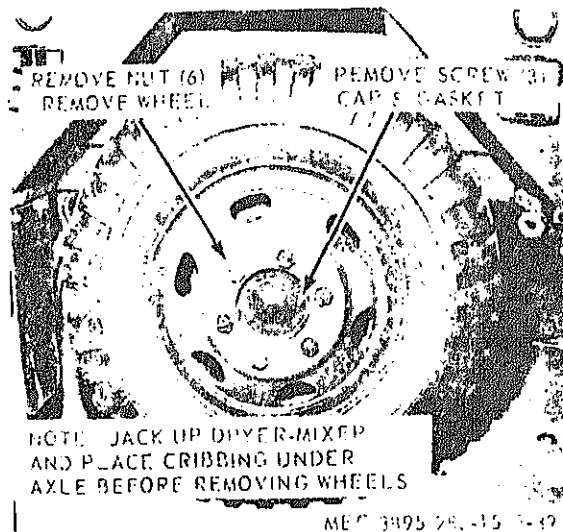
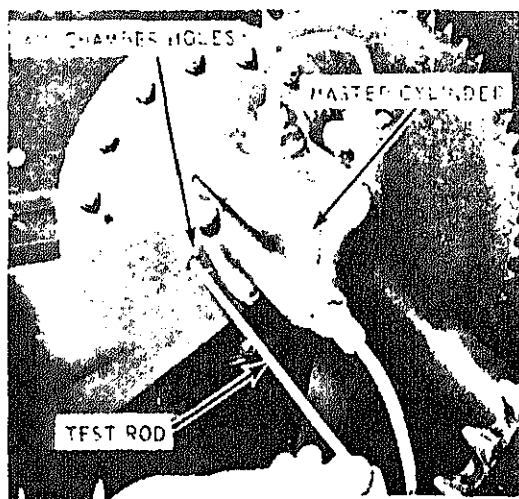


Figure 3-39. Hub and Drum Removal.

(3) Remove three hexagon nuts and lockwashers securing cylinder assembly and chamber to support brackets.

(4) Remove cylinder assembly and air chamber. Do not remove two 90° elbows and adapter from chamber or reducer and vent tube assembly from cylinder unless replacement or overhaul is required.

b. Installation.

(1) Position air chamber on operator side of support bracket with the three studs projecting through support. Position master cylinder assembly on the three studs and tighten in place with lockwashers and nuts.

(2) Connect hydraulic tube at rear of cylinder assembly.

(3) Connect air tubing to front of chamber.

c. Push Rod Travel Test (fig. 3-38).

(1) With brakes released, insert a small rod through one of two inspection holes in support and chamber. Mark rod at surface of support when rod contacts push rod return spring retainer in chamber.

(2) Apply brakes and again mark rod at surface of support with rod in contact with return spring retainer.

(3) Withdraw rod and measure distance between marks, which will indicate amount of

ravel.

3-60. Intervehicular Air Hose Assembly

a. Test and Check for Serviceability.

(1) With brake air hose couplings connected and brakes applied, coat hose couplings and connectors of air hose, fittings of air emergency and service line tubes and air tubes with soap and water solution. No leakage is permissible.

(2) Examine hydraulic lines and fittings. Tighten fittings if leakage is found.

(3) Coupling leakage is usually caused by worn, damaged or improperly installed packing ring.

(4) Tighten fittings on air lines. Tighten screws securing line clips. Inspect lines and tube for partial restrictions caused by dents and kinks. Replace with new tubing or fitting if damaged or leak cannot be stopped.

b. Installation.

(1) Attach rear end of intervehicular hose to collar at front of machine.

(2) Connect hose assembly to towing vehicle and operate brake pedal to test hose assembly for leaks with soapsuds solution.

3-61. Air Line Tubes

a. Removal. Disconnect affected air line as required.

b. Repair.

(1) Unscrew fitting from tube. Serviceable fittings may be used but sleeves must be replaced. If old tube is unusable, use old tube as a pattern and carefully bend new tube to same shape, making sure there are no kinks or sharp bends.

(2) Cut tubing, making sure end is smooth and square. Do not crimp or partially close ends. Ream or file if necessary. Blow out to remove cuttings or filings. Place nut and new sleeve on tube and put end of tube into recess in fitting body. Hold tube at bottom or recess and tighten nut to prevent leakage.

c. Installation.

(1) Connect tube to air line system as required.

(2) Make connections airtight.

(3) Close reservoir drain cock, connect

a. Removal.

(1) Disconnect intervehicular hose from towing vehicle and open reservoir drain cock.

(2) Disconnect affected tube as required.

b. Cleaning, Inspecting and Repair.

(1) Cleaning. Use low pressure air to clean inside of tubes or hose.

(2) Inspection. Inspect all parts for damage and replace if required.

(3) Repair. The repair of hydraulic lines is limited to replacement of individual parts (para 3-61b).

c. Installation and Testing.

(1) Install tubes as required.

(2) Close drain cock and connect air hose to towing vehicle. Bleed brake system (para 3-57).

(3) Visually inspect hydraulic lines and fittings for leaks.

3-63. Emergency Relay Valve Assembly

a. Service.

(1) Drainage of moisture from emergency relay valves. To drain accumulated moisture, remove drain plug. Replace after drainage (fig. 3-36).

(2) Operating test.

(a) With brake air system of trailer connected and charged, check if brakes on wheels apply properly.

(b) Release brakes and check whether air pressure is being exhausted promptly.

(c) With trailer chassis brake system fully charged, close shut-off cock in emergency line tube on towing vehicle and disconnect brake air hose coupling tagged EMERGENCY. Check whether trailer chassis brakes apply automatically.

(3) Leakage test.

(a) With air brake system of trailer connected and charged, apply soap and water solution to flanges which hold diaphragms to brake air hose coupling tagged SERVICE. No leakage should be present. Tighten nut on flanges and tighten couplings as required.

(b) Coat exhaust port with soap and water solution. Apply brakes.

(c) Release brakes and apply soap and water solution to exhaust port.

(d) With emergency relay valve

1-inch bubble in 3 seconds. If excess leakage found, replace emergency relay valve.

b. Removal.

(1) Uncouple intervehicular hose assemblies from towing vehicle. Open drain cock and disconnect all tube connections to relay valve. Remove relay valve.

(2) Remove nuts, capscrews and relay valve from the trailer frame.

c. Installation.

(1) Position valve on trailer frame and secure with screws and nuts.

(2) Tighten all tube connections. Close drain cock on reservoir and connect all intervehicular hoses to towing vehicle.

d. Test After Installation. With valve in emergency, apply soap and water to exhaust port. Leakage of 1-inch bubble in 3 seconds allowed.

3-64. Reservoir

a. Test and Check for Serviceability. With brake system charged, coat drain cock on air reservoir, tube connector and allow attaching air tube to reservoir, and outside of air reservoir with soap and water solution. No leakage is permissible. Tighten any leaking connection. Inspect for damage or corrosion. Replace reservoir if it leaks or if any damage or corrosion is found that would weaken reservoir.

b. Removal. Open drain cock on reservoir. Disconnect reservoir. Remove hex nuts, lockwasher and capscrews joining reservoir mounting brackets. Remove reservoir.

c. Installation. Position air reservoir in mounting brackets. Tighten brackets with capscrews, lockwashers and hex nuts. Connect tube to reservoir. Make leakage test.

3-65. Wheels

a. Removal.

(1) Loosen six (6) nuts securing wheel to hub (fig. 3-39).

(2) Jack up axle until wheel is clear of the ground.

(3) Remove six (6) nuts and the wheel.

b. Installation.

(1) Position wheel on hub. Install single ball seat nuts on studs, tightening alternately to insure even seating.

(2) With wheel lowered, torque to 450-500 foot-pounds.

(1) Jack up axle until wheel is off ground and remove screws, lockwashers, hub cap and gasket.

(2) Remove adjusting nut, lockwasher and second adjusting nut. Remove outer tapered roller bearing cone.

(3) Remove hub and brakedrum assembly. Remove oil seal, oil seal sleeves and inner tapered roller bearing cone from hub.

b. Disassembly.

(1) Remove cap nuts and wheel studs securing brakedrum to hub and remove drum from hub.

(2) If bearing cups must be removed, pull from hub, using bearing puller.

(3) If studs are loose or damaged, drive out of hub.

(4) Drum may be further disassembled by removing 17 lock nuts and washers and separating drum from adapter.

c. Cleaning and Inspection. Clean and inspect all parts.

d. Assembly.

(1) If any wheel studs were removed from hub, drive new studs into place.

(2) If bearing cups were removed from hub, press cups into ends of hub until seated on shoulders.

(3) Position brakedrum on hub with bolt holes aligned and secure with six (6) wheel studs.

e. Installation.

(1) Install inner tapered roller bearing cone oil seal sleeve and oil seal in inner end of hub and brakedrum assembly.

(2) Slide hub and brakedrum assembly onto spindle and install outer tapered roller bearing cone and adjusting nut, flat side in.

(3) While rotating hub and drum, tighten adjusting nut until a distinct drag is felt in hub and drum. Loosen nut until hub and drum turn freely and install external-tooth lockwasher and second adjusting nut, flat side out.

(4) When adjustment is satisfactory, bend tab of lockwasher into groove of outer nut.

(5) Position hub cap gasket on hubcap and secure with three (3) lockwashers and

Section I. GENERAL

4-1. Scope

These instructions are published for the use of direct and general support and depot maintenance personnel maintaining the McConnaughay Model HTD-A-67 Drier-Mixer. They provide information on the maintenance of the equipment which is beyond the scope of tools, equipment, personnel or supplies normally available to using organization.

4-2. Record and Report Forms

For record and report forms applicable to direct and general support and depot maintenance, refer to TM-38-750.

Note. Applicable forms including standard forms which is carried by the operator, shall be kept in a canvas bag mounted on equipment.

Section II. DESCRIPTION AND TABULATED DATA

4-3. Description

For a complete description of the McConnaughay Model HTD-A-67 Drier-Mixer see paragraph 1-3.

4-4. Tabulated Data

a. General. This paragraph contains all the overhaul data pertinent to direct and general support and depot maintenance personnel. A wiring diagram (fig. 4-1) and a brake system diagram (fig. 4-2) are also included.

b. Engine and Clutch Reduction Gear Rebuild Data.

(1) Engine data.

Rotation when viewing the flywheel	Clockwise
No load rpm	1950
Load rpm	1800
Horsepower at 1800 rpm	21
Governor lever hole used to obtain 1800 rpm	7

(a) Piston data.

Number of piston assemblies	4
Piston to cylinder clearance at piston skirt	.004" to .0049"
Oversize	.020" to .040"

(b) Ring data.

Number of ring sets	4
Piston ring compressed	

gap	.010"
Compression ring side clearance in grooves	.002"
Scraper ring side clearance in grooves	.0015"
Oil ring side clearance in grooves	.001"
Ring oversize	.020"
(c) Rod data.	
Number of rods	4
Connecting rod to crank pin side clearance	.000"
Connecting rod shell bearing to crank pin	.0005" to .0000"
Piston pin to connecting rod bushing	.0000"
Shell bearing part number	MS-135
Piston pin bushing part number	MS-134
Piston pin part number	MS-133
(d) Crankshaft data.	
End Play	.002"
Crankshaft journal diameter	1.8111
Crankshaft journal width	1.197

Figure 4-1—CONTINUED

(e) *Main bearing part numbers.*

Flywheel end ME-71
Take-off end ME-114

(f) *Valve data.*

Number of inlet valves 4
Inlet valve tappet adjustment .008"
Number of exhaust valves 4
Exhaust valve tappet adjustment .016"
Valve stem clearance in guides .0025" to .0045"
When clearance becomes .008" replace guides.

(g) *Magneto part number*

FM-2VB4B7-4

(h) *Carburetor.*

Size designation 7
Flange size SAE
STANDARD
Type Updraft single Venturi design
Part number 5-632-B

(i) *Fuel pump part number* LP-38-C

(j) *Governor part number* T-84-H

(2) *Clutch reduction gear part numbers.*

Clutch reduction gear unit WW-62-F-2
Clutch CLA-1467-23

c. *Asphalt Pump, Clutch, and Counter Rebuild Data.*

(1) *Asphalt pump data.*

Rotation viewed from shaft end Clockwise
Casing parts Righthand, 1½"
Shaft dimensions
Length 13¼"
Diameter .749" to .750"
Keyway ¼" x 6"
Shaft assembly part number 3-567-402-420-34
Packing Hot Oil ¾" x 1 5/16" x ¼"

Number of rings 5
Pump part number 4-1412-1111
50 pounds

Clutch part number AK 2-2
Number of friction discs 2
Friction discs part number AL15

(3) *Counter.*

Counter part number 4-CS-7 : L BP CL
Belt part number 105 B
Pulley Asphalt Pump Shaft M-AP-P-1
Pulley Counter Shaft M-AP-P-2

d. *Fuel Oil Pump and Blower Rebuild Data.*

(1) *Fuel oil pump data.*

Rotation viewed from shaft end Clockwise
Shaft data
Length extended from pump body 19 16"
Diameter .4385"
+ .0000" to .041"
Part number 112197
Pump part number JERA-200-3
Extensions shaft data
Length 16½"
Diameter ¾"
Pulley (Inside) part number BK-40
Pulley (Outside) part number BK-45
Bearing part number SUP-5

(2) *Blower data.*

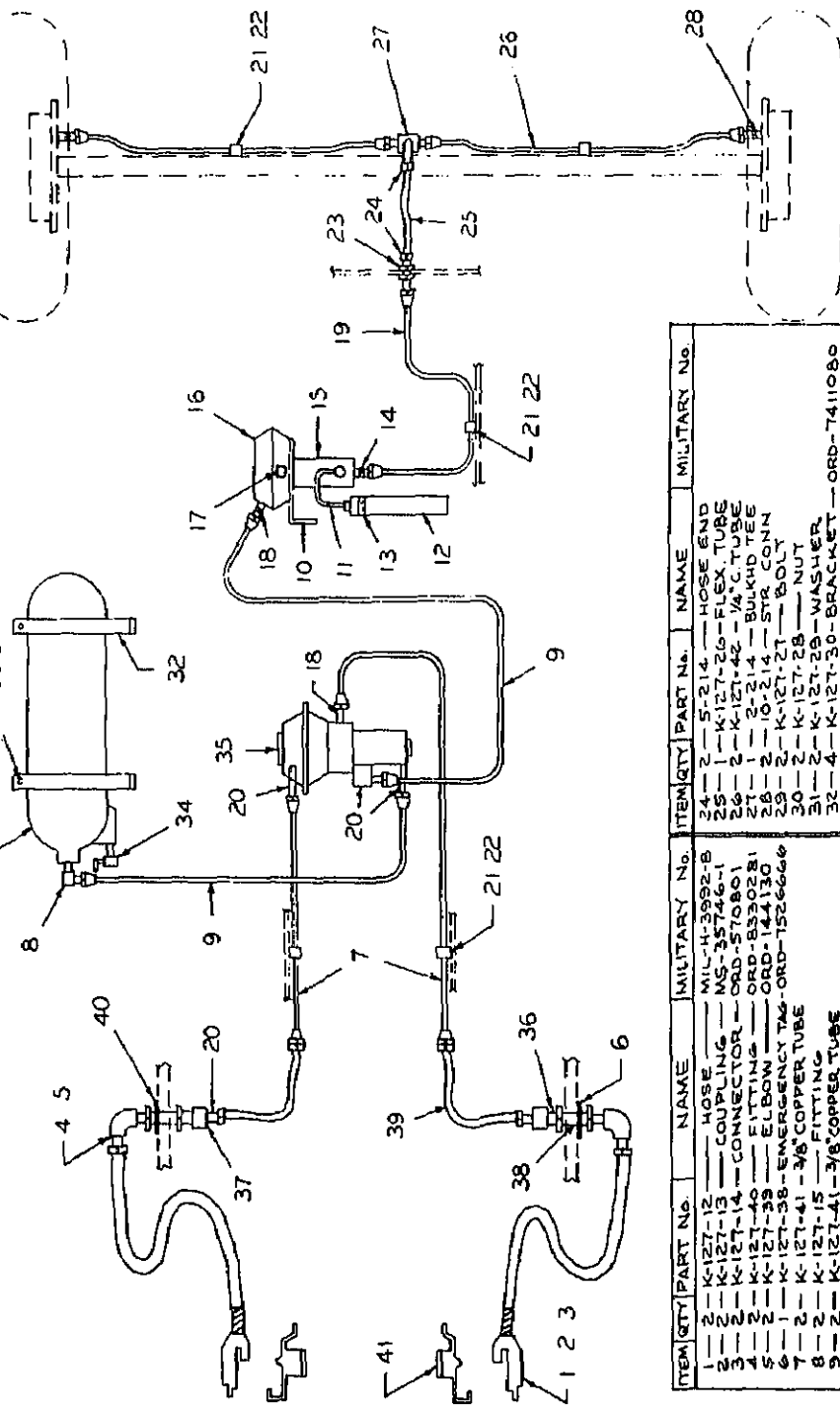
Rotation viewed from pulley end Clockwise
Shaft data
Length 8½"
Diameter ¾"
Part number M-BL-3
Blower part number M-BL
Bearings (2) part number SUP-5
Pulley part number BK-60
Belt part number for pump and blower STYLE A VEELOS

e. *Shaft Rebuild Data.*

(1) *Mixing shaft data.*

(a) *Rear shaft data.*

Length 53½"
Diameter 2 7/16"
Part number M-S-1-R



ITEM	QTY	PART NO.	NAME	MILITARY NO.	ITEM	QTY	PART NO.	NAME	MILITARY NO.
1	2	K-127-12	HOSE	MIL-H-3992-B	24	2	5-214	HOSE END	
2	2	K-127-13	COUPLING	MS-35746-1	25	1	K-127-26	FLEX. TUBE	
3	2	K-127-14	CONNECTOR	ORD-57080-1	26	2	K-127-42	1/4" C. TUBE	
4	2	K-127-40	FITTING	ORD-8330281	27	1	2-214	BULKHD TEE	
5	2	K-127-39	ELBOW	ORD-144130	28	2	10-214	STR. CONN	
6	1	K-127-38	EMERGENCY TAG	ORD-1526666	29	2	K-127-21	BOLT	
7	2	K-127-41	3/8" COPPER TUBE		30	2	K-127-28	NUT	
8	2	K-127-15	FITTING		31	2	K-127-29	WASHER	
9	2	K-127-41	3/8" COPPER TUBE		32	4	K-127-30	BRACKET	ORD-741088
10	2	K-127-16	BRACKET	ORD-8688491	33	1	K-127-31	TANK	ORD-741078
11	1	K-127-17	TUBE	ORD-8365426	34	1	K-127-32	DRAIN COCK	MS-35782-5
12	1	K-127-18	HOSE	ORD-8365425	35	1	K-127-33	VALVE	MS-53004-1
13	1	K-127-19	CLAMP	MS-35842-1	36	2	K-127-34	NIPPLE	ORD-120286
14	1	K-127-20	FITTING		37	2	K-127-35	CLEANER	ORD-741022
15	1	K-127-21	MASTER CYLINDER	ORD-8357980	38	2	K-127-36	ADAPTER	MS-39179-5
16	1	K-127-22	CHANGER ASSY	ORD-8357981	39	2	K-127-43	HOSE	MIL-H-3992-1
17	1	K-127-23	COLLAR	ORD-8365427	40	1	K-127-37	SERVICE TAG	ORD-1526665
18	2	K-127-24	TUBE CONN.		41	2	K-127-38	HANGER	6N-1702
19	1	K-127-42	1/4" COPPER TUBE						
20	5	K-127-25	TUBE ELBOW						
21	5	2-314	CLAMP						
22	5	2-419	SCREW						
23	1	3-214	BULK HD. ELBOW						

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Figure 4-2. Brakes System Diagram.

Part number M-S-1-F
Bearings (4) part
number SCB-2 7/16

Part number M-JS-1
Bearings (2) part
number SC-1 11/16

CHAPTER 5

GENERAL MAINTENANCE INSTRUCTIONS

Section I. SPECIAL TOOLS AND EQUIPMENT

5-1. Special Tools and Equipment

No special tools or equipment are required to perform direct and general support and depot maintenance on the McConnaughay Model HTD-A-67 Drier-Mixer.

5-2. Specially Designed Tools and Equipment

No specially designed tools and equipment are required to perform direct and general support and depot maintenance on the McConnaughay Model HTD-A-67 Drier-Mixer.

Section II. TROUBLESHOOTING

5-3. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the McConnaughay Model HTD-A-67 Drier-Mixer or any of its components. Each trouble symptom stated is followed by a list of probable causes. The possible remedy

recommended is described opposite the probable cause.

5-4. Trouble Shooting Data

See section V, chapter 3 for detailed symptoms, probable causes and possible remedies.

Section III. RADIO INTERFERENCE SUPPRESSION

5-5. General

Refer to TM 11-488 for definitions, purposes, source and methods used to obtain proper radio suppression.

5-6. Interference Suppression Components

Refer to paragraph 3-31 for interference suppression components.

5-7. Replacement of Suppression Components

Refer to paragraph 3-32 for the replacement of suppression components.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS AND AUXILIARIES

5-8. Engine

- a. *Removal.* Refer to paragraph 3-34a.
- b. *Installation.* Refer to paragraph 3-34b.

5-10. Asphalt Pump Assembly and Drive

- a. *Removal.* Refer to paragraph 3-52a.
- b. *Installation.* Refer to paragraph 3-52c.

5-9. Landing Leg

5-11. Fuel Oil Pump Assembly and Drive

- a. *Removal.* Refer to paragraph 3-51a and d.
- b. *Installation.* Refer to paragraph 3-51c and e.

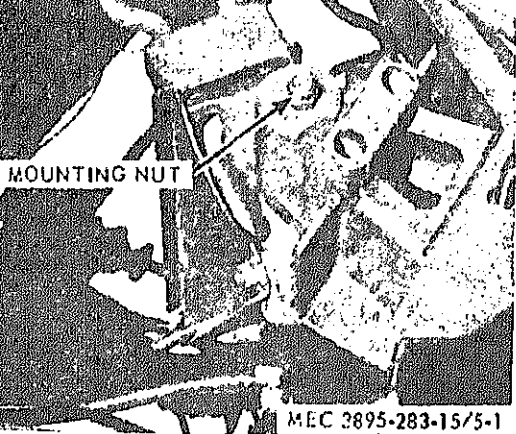


Figure 5-1. Landing Leg Removal.

b. *Installation.* Refer to paragraph 3-50c.

5-13. Pugmill Burner

a. *Removal.* Refer to paragraph 3-48a.

b. *Installation.* Refer to paragraph 3-48c.

5-14. Asphalt Tank Burner

a. *Removal.* Refer to paragraph 3-49a.

b. *Installation.* Refer to paragraph 3-49c.

5-15. Jack Shaft

a. *Removal.* Refer to paragraph 3-54a.

b. *Installation.* Refer to paragraph 3-54c.

5-16. Mixing Shafts, Paddles, and Tips

a. *Removal.* Refer to paragraph 3-55a.

b. *Installation.* Refer to paragraph 3-55b.

CHAPTER 6

ENGINE REPAIR INSTRUCTIONS

Section I. ENGINE ACCESSORIES

6-1. General

This section contains those items which are considered accessories to the engine. They consist of air cleaner, oil filter and magneto.

Note. Engine repairs should be made only by a machinist who has had experience in such work. When disassembling the engine it is advisable to have several boxes available so that the parts belonging to certain groups can be kept together.

Note. An engine that has been completely overhauled, such as having the cylinders rebored and fitted with new pistons, rings and valves should go through a thorough "run-in" period, before any amount of load is applied to the engine.

6-2. Air Cleaner

Refer to LO 5-3895-283-12.

6-3. Oil Filter

Refer to LO 5-3895-283-12.

6-4. Magneto

a. General. The magneto is a special unit designed and built for use on the Model MVF 4D engine. It has a four pole rotor and a four lobes cam, producing four sparks per revolution of the rotor, which runs at crankshaft speed.

b. Removal. To remove magneto, refer to paragraph 3-38d.

c. Testing. To test magneto, refer to paragraph 3-38b.

d. Servicing of Breaker Points. Refer to paragraph 3-38c.

e. Repair. For repair of magneto, use kit No. 9K44 for FM-ZVE4B7 Magnetos. Refer to Table 6-1 for components of kit.

Table 6-1. Components of Magneto Kit SK-44.

V1408	1 Snap Ring
B1498B	1 Snap Ring
B1498D	1 Snap Ring
C1498G	1 Breaker Snap Ring
EX 2493	1 Condenser
A2437A	1 Point Set
E24608	1 Brush Assembly
H2473	1 "O" Ring Seal
A2492A	1 Seal Outer Washer
A2492C	2 Seal Inner Washer
K2498	1 End Cap to Housing Gasket
G3861	1 Rotor Shaft Seal
10510D	2 End Cap Screw

f. Sealing Magneto. Before replacing the end cap on the magneto frame, clean the contact surfaces between the cap and the frame. Place a new gasket in the joint, and mount the end cap on the frame, tightening the four screws securely.

g. Magneto Timing and Installation. Refer to paragraph 3-38e.

Section II. ENGINE COMPONENTS

6-5. General

The engine is a four-cycle, four-cylinder, air-cooled engine. Engine components are described in applicable paragraphs throughout this section.

6-6. Removal, Inspection and Installation of Muffler

See paragraph 3-35 and 3-36.

6-7. Flywheel

a. Removal (fig. 6-1).

(1) After the flywheel screen has been removed, drive out the starting crank pin in the crankshaft and remove the flywheel nut and washer.

(2) The flywheel is mounted to a taper on the crankshaft. Take a firm hold on the fly-

the end of the crankshaft with a babbitt liner.

Installation. Be sure the Woodruff key is in position on the shaft and that the keyway in the flywheel is lined up accurately with the

Removal, Inspection, and Installation of Carburetor and Manifolds
paragraph 3-37, 3-39 and 3-40.

Removal, Inspection and Installation of Cylinder Heads
paragraph 3-42.

D. Gear Cover

Removal figure 6-2.

(1) Disconnect the governor linkage and move the governor.

(2) Remove gear cover screws and drive the two dowel pins.

(3) Lift cover away exposing the timing gears.

Installation. In reassembly tighten cap screws 14 to 18 foot-pounds torque.

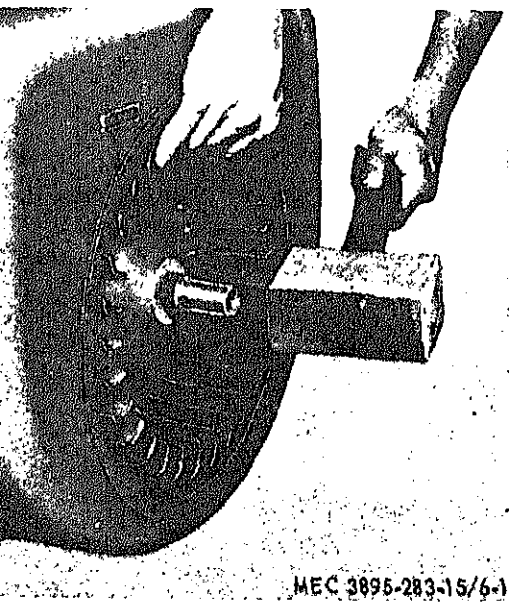


Figure 6-1. Flywheel Removal.

1. Camshaft Gear

Removal (fig. 6-3).

(1) Remove the three cap screws and lock washers which hold the gear to the end of the

a screw drive or similar wedge tool.

b. Installation. The gear mounting holes are staggered in such a manner that the gear can be assembled only one way, which will automatically time the gear to the shaft.

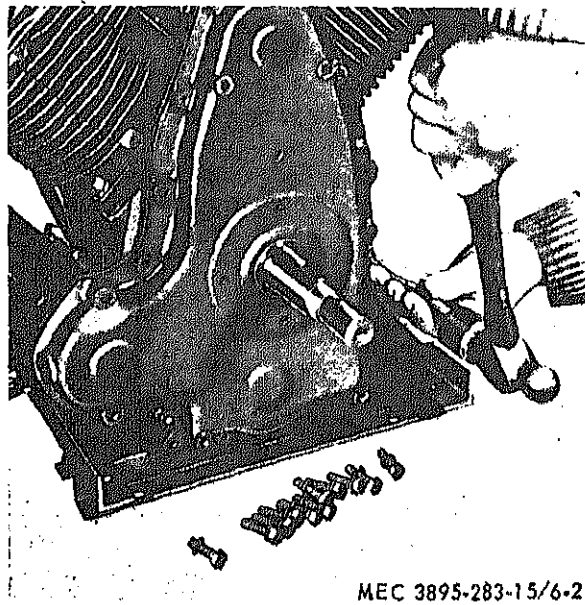
6-12. Idler Gear and Shaft

a. Removal (fig. 6-4).

(1) Remove Allen-head set screw on the magneto side of the crankcase which locks the idler shaft in position.

(2) With gear puller, remove idler shaft and idler shaft gear assembly.

b. Installation. Allow .003" to .004" clearance between idler gear and shaft collar.



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Figure 6-2. Gear Cover Removal.

6-13. Oil Pump

a. Removal (fig. 6-5, 6-6, and 6-7).

(1) Remove oil pan.

(2) Take out the slotted pipe plug.

(3) With 5/32 Allen wrench, remove the oil pump lock screw.

(4) Unscrew locknut holding oil pump driving gear to shaft.

(5) With a soft brass rod or punch, drive shaft through gear.

(6) Withdraw oil pump toward center of crankcase.

b. Installation. Replace all the old gaskets

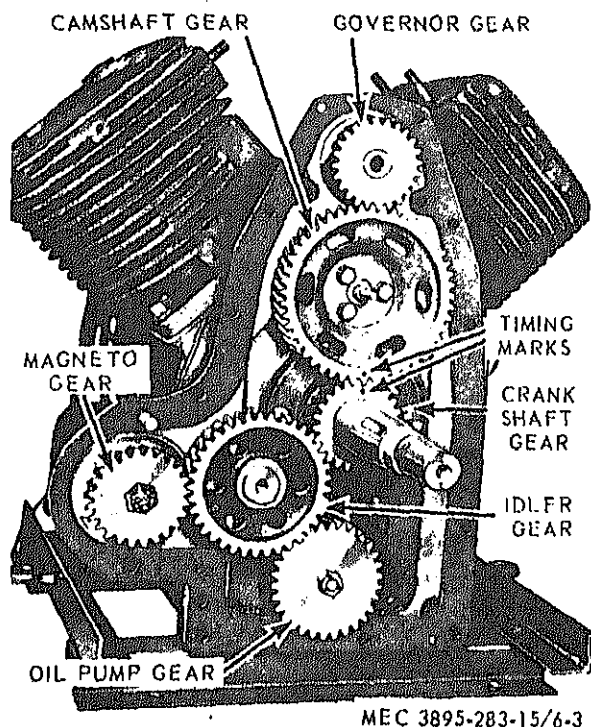


Figure 6-3. Exposed Gears.

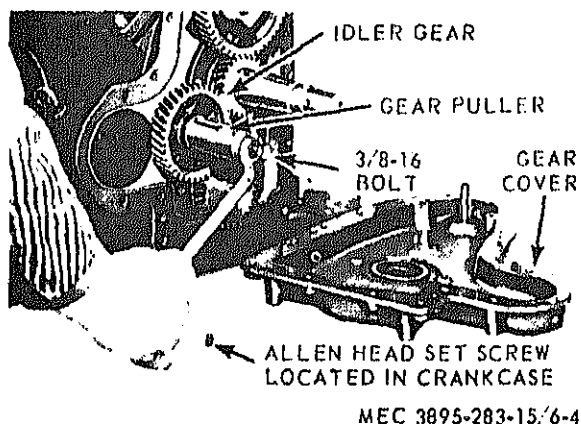


Figure 6-4. Idler Gear and Shaft Removal.

6-14. Piston and Connecting Rods

a. Removal (fig. 6-8).

(1) After removal of the oil pump, all of the connecting rod bolts will be accessible.

(2) Remove nuts and then tap ends of

so that they are on the correct rod for reassembly. A number is stamped on the side of the rod and cap to match each connecting rod with its corresponding cap. These numbers must be on the same side of the connecting rod in reassembly.

b. Installation.

(1) When replacing the steel bearings, be sure to replace a complete bearing (2 halves) and take care that they are in place in the rod and cap.

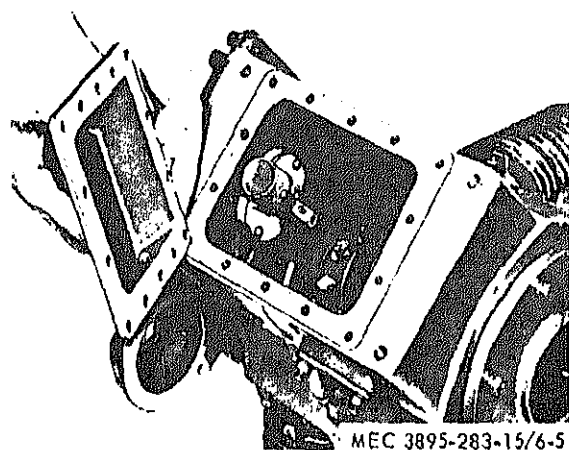
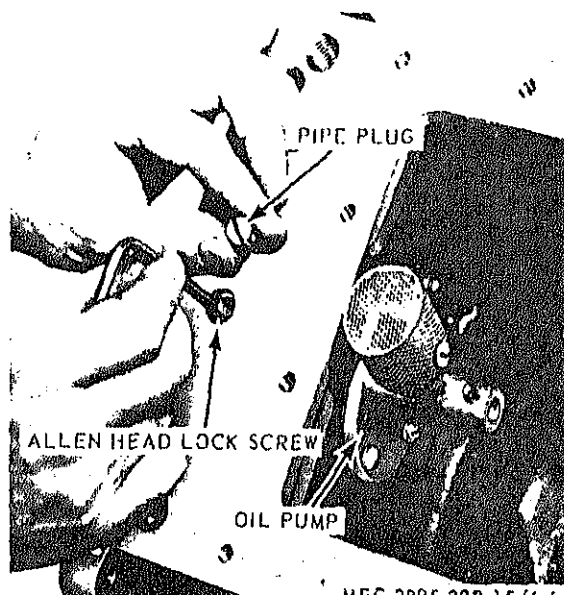


Figure 6-5. Oil Pan Removal.



to slip over piston and into correct groove, being careful not to distort ring.

(b) Scraper ring must be installed with the scraper edge down, otherwise oil pumping and excessive oil consumption will result. (fig. 6-9b).

(c) Use a suitable ring compressor in reassembly and stagger the piston ring gaps 90° apart around the piston.

(3) Oil the piston, rings, wrist pin, rod bearings and cylinder walls before assembly.

(4) Assemble by reversing steps in section *a* above.

6-15. Cylinders

a. Removal. After the removal of the pistons the cylinders can be removed from the crankcase if necessary.

b. Inspection and Cleaning.

(1) Clean all dirt and other deposits from fins.

(2) If the cylinders are worn more than .005 inch oversize, they should be reground and fitted with oversize pistons and rings.

c. Installation.

(1) Replace all old gaskets.

(2) Put the blocks back on the same side from which they were removed.

(3) Tighten cylinder block mounting nuts with 40 to 50 foot pounds torque.

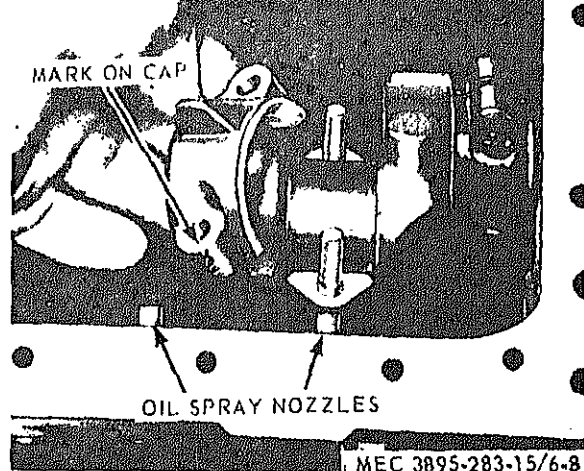


Figure 6-8. Piston and Connecting Rod Removal.

Note. If cylinder block is still attached to the engine, insert a rag in the bottom of the valve chamber so the roto-cap and valve spring seat retaining locks do not fall into the crankcase.

(3) Remove roto-caps, valve spring seat retaining locks, seats, springs, valves and clean these as well as the parts and guides.

(4) Tag each valve so that in reassembly they will be mounted in the same guide from which they were removed.

b. Grind and Lap. The valve face is ground at 45° to the vertical center line of the valve stem. The valve seat insert should also be ground at a 45° angle. After grinding, valves and inserts should be lapped with a suitable lapping compound or they will leak due to improper seating within the first few hours of operation. After valve seats have been cleaned, apply lapping compound to the valve face and put the valves back into their guides. Lap the valves by rotating them back and forth with a reciprocating advancing valve tool. Occasionally lift the valves and reseal them in a different position to insure a uniform seat which will show entirely around the valves. After valves have been lapped in evenly, remove them from the block and wash the valves and block thoroughly with kerosene.

Valve guides to valve stems should have a clearance of .0025" to .0045" When the clearance becomes .008", the guides should be driven out and replaced with new guides.

c. Installation.

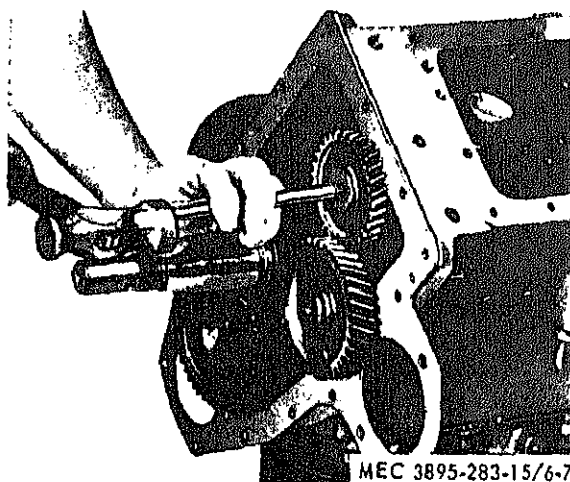
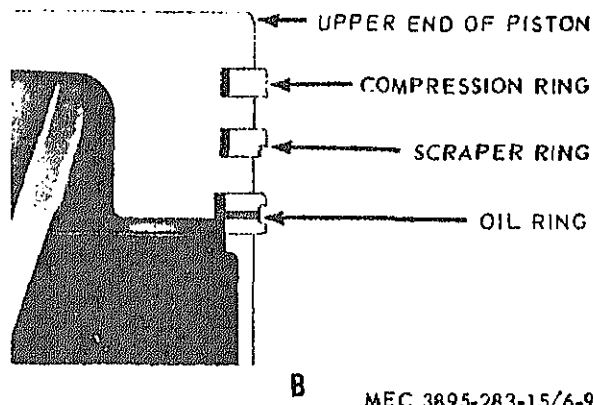
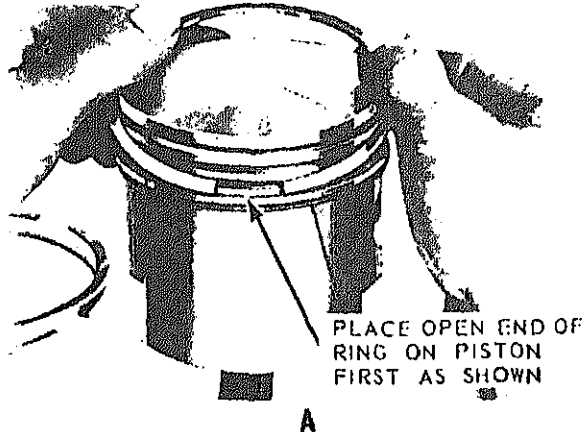


Figure 6-7. Oil Pump Removal.

6-16. Valves

a. Removal (fig. 6-10).



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Figure 6-9. Ring Installation.

(2) Tappet adjustment should be as follows:

- (a) Inlet .008" (Cold engine).
- (b) Exhaust .016", refer to figure 3-22.

6-17. Crankshaft

a. Removal (fig. 6-11).

(1) Remove the six capscrews in the main bearing plate at the take-off end and pry off plate.

(2) Slide crankshaft out.

Note. Be sure to keep shims and gaskets in place as these are required to give the proper end play to the tapered roller main bearings on the crankshaft. This end play should be .002 to .004 inch when engine is cold.

b. Installation.

(1) The timing marks on the crankshaft gear and the camshaft gear must be matched (fig. 6-3).

(2) Mounting holes in main bearing plate are off-set in such a manner that it can only be mounted in the correct position. Tighten main bearing plate capscrews with 25 to 30 foot pounds torque.

6-18. Camshaft

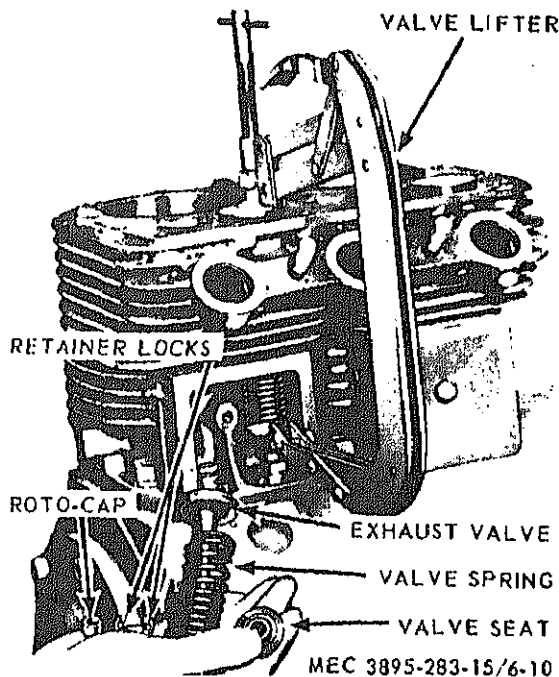
a. Removal.

(1) The camshaft must be withdrawn from the flywheel end.

(2) Refer to figure 6-12 for the removal of the camshaft.

b. Installation.

(2) Refer to figure 6-13 for the installation of the camshaft.

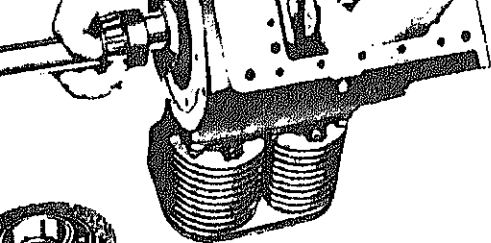


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Figure 6-10. Valve Removal.

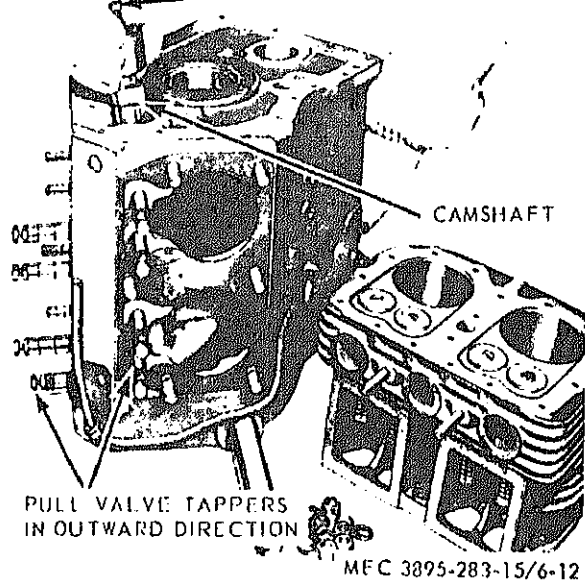
6-19. Adjustments to be Made on Rebuilt Engine are as Follows

- a. Valve Tappets. Refer to paragraph 3-48c.
- b. Governor. Refer to paragraph 8-45c.
- c. Carburetor. Refer to paragraph 3-9b.
- d. Magneto. Refer to paragraph 3-38, c and



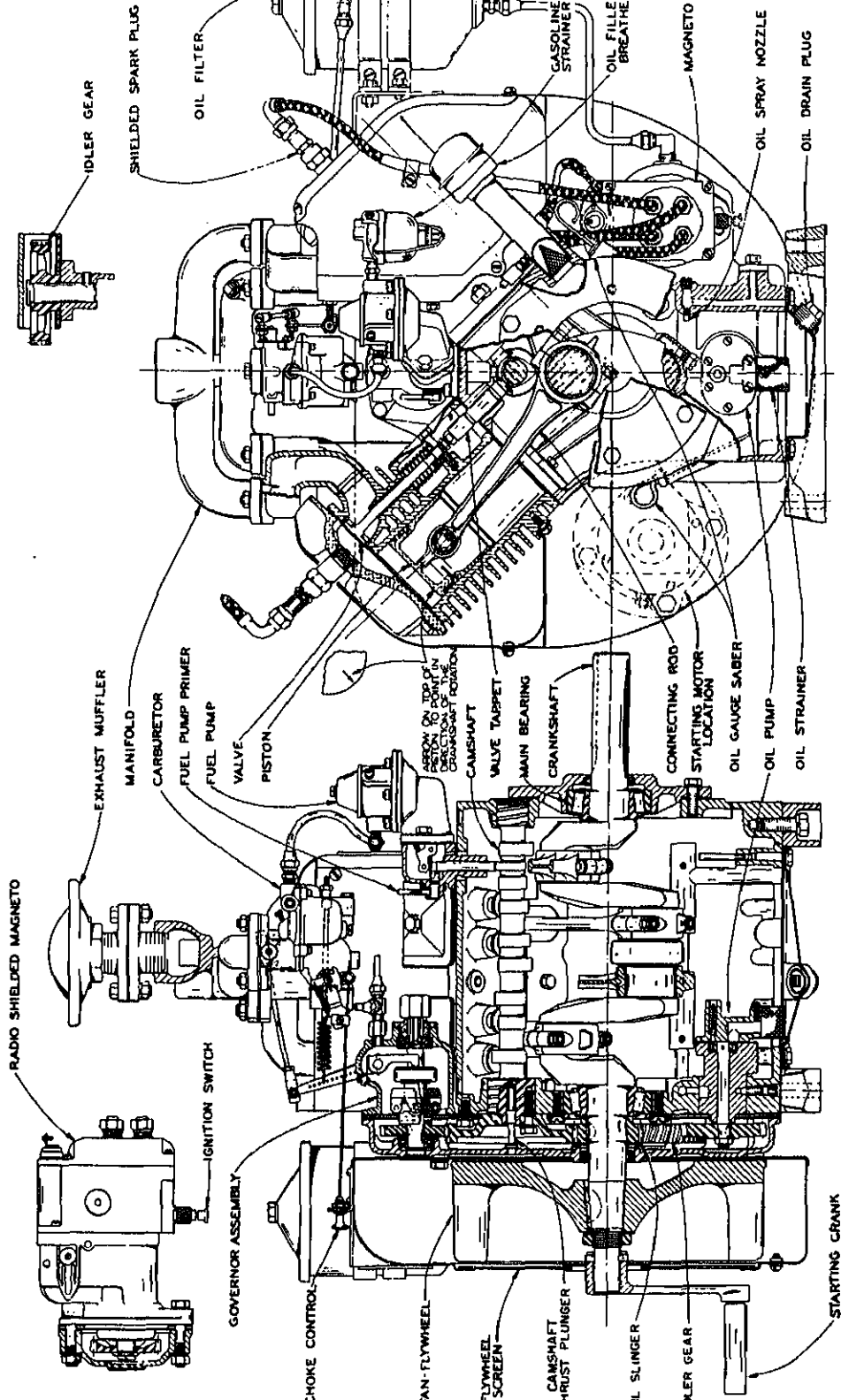
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Figure 6-11. Crankshaft Removal.



MEC 3895-283-15/6-12

Figure 6-12. Camshaft Removal.



MIXER COMPONENTS REPAIR INSTRUCTIONS

Section I. ASPHALT PUMP, CLUTCH, AND COUNTER

7-1. General

This section contains repair instructions for the asphalt pump, asphalt pump clutch and asphalt pump counter.

7-2. Asphalt Pump

a. Removal. Refer to paragraph 3-52a.

b. Disassembly. Refer to figure 3-32 for the disassembly of the asphalt pump.

Note. Rotor and shaft are special and can be purchased only on a subassembly, not separately.

c. Reassembly. Clean all parts, check for worn or damaged parts, use new packing and reassemble in accordance with figure 3-32.

d. Installation. Refer to paragraph 3-52c.

7-3. Asphalt Pump Clutch

a. Removal. Refer to paragraph 3-52.

b. Disassembly. Refer to figure 3-33 for the disassembly of the clutch.

c. Reassembly. Clean all parts, check for worn or damaged parts and reassemble in accordance with figure 3-33.

d. Installation. Refer to paragraph 3-52c.

7-4. Counter

Replace worn or broken belt. If the counter is not functioning properly, it is advisable to replace it rather than try to repair it.

Section II. FUEL OIL PUMP

7-5. General

This section contains repair instructions for the fuel oil pump which is a single stage, 20 GPH (gallons per hour) low vacuum pump.

7-6. Fuel Oil Pump

a. Removal. Refer to paragraph 3-51a.

b. Disassembly. Refer to figure 3-30 for the disassembly of the pump.

c. Reassembly. Clean all parts, check for worn or damaged parts, replace seals and reassemble in accordance with figure 3-30.

d. Installation. Refer to paragraph 3-51c.

Section III. LANDING LEG

7-7. General

This section contains repair instructions for the landing leg which is used to support the unit when not attached to a truck.

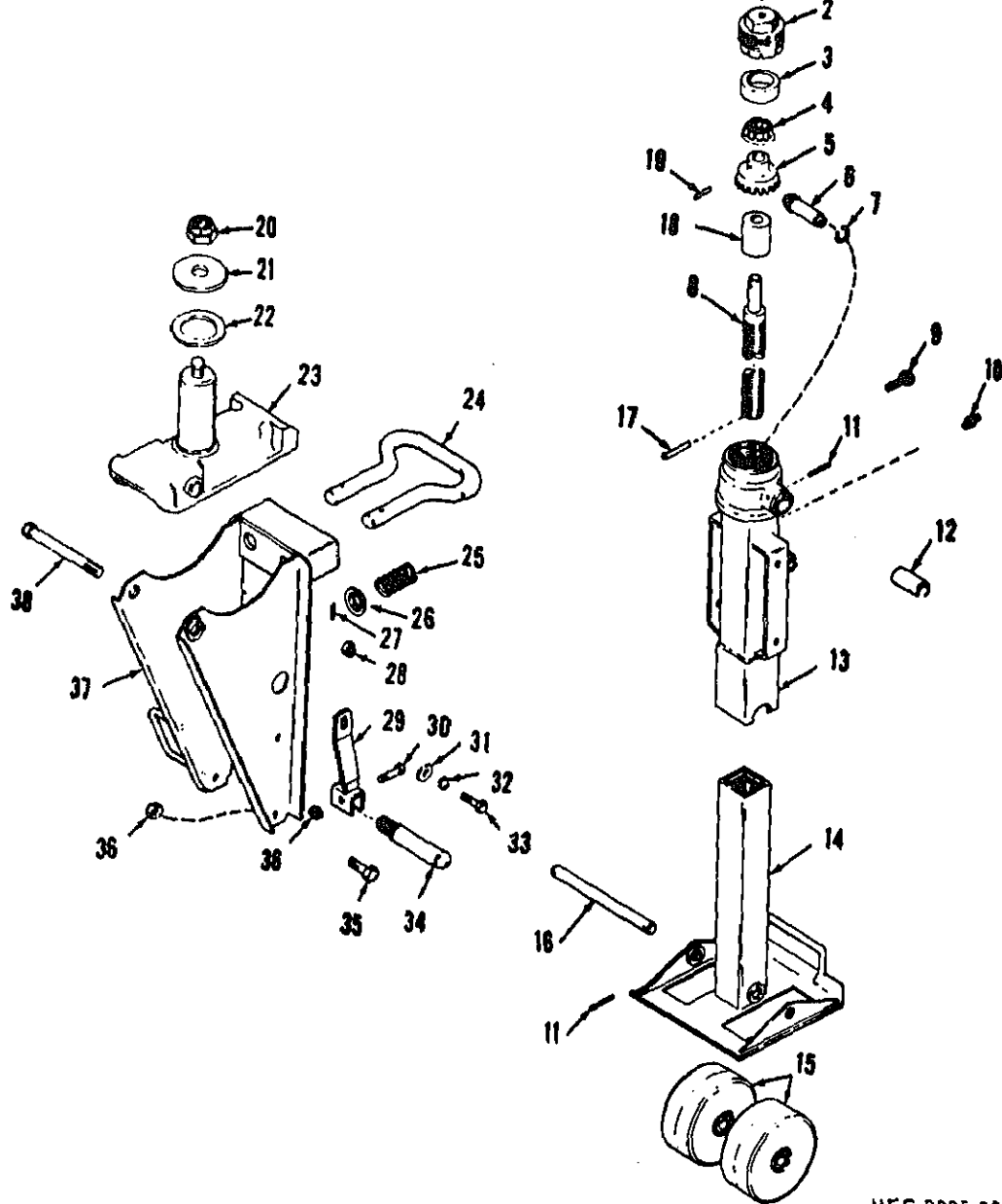
7-8. Landing Leg

a. Removal. Refer to paragraph 5-9a.

b. Disassembly. Refer to figure 7-1 for disassembly of the landing leg.

c. Reassembly. Clean all parts, check for worn or damaged parts and reassemble in accordance with figure 7-1.

d. Installation. Refer to paragraph 5-9.



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- | | | |
|------------------|---------------------------------|-----------|
| 1 Lube Fitting | 14 Tube Assembly | 26 Washer |
| 2 Cap | 15 Wheel | 27 Pin |
| 3 Cup | 16 Axle | 28 Nut |
| 4 Cone | 17 Pin | 29 Arm |
| 5 Gear (Bevel) | 18 Spacer | 30 Bolt |
| 6 Gear (Bevel) | 19 Pin | 31 Washer |
| 7 Washer | 20 Nut | 32 Washer |
| 8 Screw | 21 Washer | 33 Bolt |
| 9 Bolt | 22 Washer | 34 Handle |
| 10 Lub Fitting | 23 Bracket and Spindle Assembly | 35 Bolt |
| 11 Pin | 24 Handle | 36 Nut |
| 12 Bushing | | 37 Frame |
| 13 Tube Assembly | | |

APPENDIX A

REFERENCES

A-1. Not Used

A-2. Fire Protection

TM5-687

Repair and Utilities: Fire Protection Equipment and Appliances: Inspections, Operations, and Preventive Maintenance.

A-3. Lubrication

LC 5-3895-283-
12

Drier-Mixer, Bituminous, Concrete Materials Wheel Mounted, Gasoline Engine Driven, Wheel, Pneumatic Tires; 5 to 10 Tons Per Hour (McConnaughay Model HTD-A-67) Wisconsin Engine Model MVF 4D.

A-4. Painting

TM 9-213

Painting Instructions for Field Use.

A-5. Maintenance

FSC 10-C9100-
1L

Fuels, Lubricants, oils, and waxes.

AR 700-38

Unsatisfactory Equipment Report.

TM 9-1870-1

Care and Maintenance of Pneumatic Tires.

TM 38-750

Army Equipment Record Procedures.

A-6. Not Used

A-7. Radio Interference Suppression

TM 11-483

Radio Interference Suppression

A-8. Shipment and Limited Storage

TM 38-230

Preservation, Packaging and Packing of Military Supply Equipment.

A-9. Not Used

A-10. Not Used

APPENDIX B

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists items which accompany the Drier-Mixer or are required for installations, operation or operators maintenance.

B-2. General

This Basic Issue Items List is divided into the following sections:

a. Basic Issue items—Section II. A list of items which accompany the Drier-Mixer or are required for the installation, operation or operator's maintenance.

b. Maintenance and Operating Supplies—Section III. A listing of maintenance and operating supplies required for initial operation.

B-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items, Section II.

a. Source, Maintenance and Recoverability Codes (SMR), Column (1).

(1) Source Code, indicates the selection status and source for the listed item. Source codes are:

Code

Explanation

P

Applied to repair parts which are stocked in or supplied from GSA/DSA or Army supply system, and authorized for use at indicated maintenance categories.

M

Applied to repair parts which are not procured or stocked but are to be manufactured at indicated maintenance categories.

A

Applies to assemblies which are not procured or stocked as such, but made up of two or more units, each of which carry individual stock numbers and de-

Code

Explanation

stocked and can be assembled at indicated maintenance category.

X

Applied to parts and assemblies are not procured or stocked, the majority of which is normally built of the applicable end item, failure of which should result in retirement of the end item from supply system.

X1

Applied to repair parts which are not procured or stocked, the repair for which will be supplied by the next higher assembly or subassembly.

X2

Applies to repair parts which are not stocked. The indicated maintenance category requiring such repair parts to obtain them through cannibalization; if not obtainable through cannibalization, such repair parts be requisitioned with supporting documentation through normal supply channels.

C

Applied to repair parts authorized for local procurements. If not obtainable from local procurement, such repair parts will be requisitioned through normal supply channels with supporting statement of non-availability from local procurement.

G

Applied to major assemblies that are procured with PEMA (Procurement Equipment Missile Army) for initial issue only to be used to change assemblies at DSU and depot level or returned to depot supply. *Note.* Source and recoverability codes are not shown on common hardware items known to be readily available through Army supply channels and through

he listed item. The maintenance level is:

Operator/crew

Organizational Maintenance

3) Recoverability Code, indicates unserviceable items should be returned for recovery of salvage. Items not coded are ex-
ple. Recoverability Codes are:

Explanation

Applied to repair parts and assemblies which are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.

Applied to high dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts are normally repaired or overhauled at depot maintenance activities.

Applied to repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value reusable casings and castings.

Federal Stock Number, Column (2). This column indicates the Federal stock number for item.

Description, Column (3). This column indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code and manufacturers in parentheses. Repair parts activities included in kits, sets and assemblies shown in front of the repair part name.

Unit of Issue, Column (4). This column indicates the unit used as a basis for issue, e.g., in. ft. yd, etc.

Quantity Incorporated in Unit Pack, Column (5). This column indicates the actual quantity contained in the unit pack.

Quantity Incorporated in Unit, Column (6). This column indicates the quantity of the item used in the functional group.

Quantity Furnished With Equipment, Column (7). This column indicates the quantity of the item furnished with the equipment.

Quantity Authorized, Column (8). This column indicates the quantity of an item au-

thorized. Illustration, Column (9). This column is divided as follows:

(1) **Figure Number, column (9) (a).** Indicates the figure number of the illustration in which the item is shown.

(2) **Item Number, column (9) (b).** Indicates the callout number used to reference the item in the illustration.

B-4. Explanation of Columns in the Tabular List of Maintenance and Operating Supplies—Section III

a. **Component Application, Column (1).** This column identifies the component application of each maintenance or operating supply item.

b. **Federal Stock Number, Column (2).** This column indicates the Federal stock number for the item and will be used for requisitioning purposes.

c. **Description, Column (3).** This column indicates the item and brief description.

d. **Quantity Required for Initial Operation, Column (4).** This column indicates the quantity of each maintenance or operating supply item required for initial operation of the equipment.

e. **Quantity Required for 8 Hours Operation, Column (5).** This column indicates the estimated quantities required for an average eight hours of operation.

f. **Notes, Column (6).** This column indicates informative notes keyed to data appearing in a preceding column.

B-5. Federal Supply Code for Manufacturers

Code	Manufacturer
00000	Ordinance Corps.
13743	Columbus McKinnon Chain Div., Columbus McKinnon Corp.
17624	Asphalt Equipment Company, Inc.
18265	Donaldson Company, Inc.
38056	Manning, Maxwell, & Moore, Div. of Dresser Industries, Inc.
40342	Midland-Ross Corporation
52793	Saginaw Products, Corp.
57738	Stewart Warner, Corp.
60038	Timken Roller Bearing Company
61208	Twin Disc Clutch Company
63097	Viking Pump Company
66289	Wisconsin Motor, Corp.
71176	Browning Manufacturing, Co.
71785	Cinch Manufacturing, Co.
71956	Dodge Manufacturing, Corp.

78480	Tillotson Mfg. Co. The
79502	Western Metal Specialty Company
79960	Zenith Carburetor Div. of Bendix Corp.
81733	Link Belt Company
82796	Fairbanks Morse and Company, Beloit Works Div.
86107	Central Brass Manufacturing Company

99830	McConaughay Mixers, Inc.
99881	Gates Rubber Company
*	Aurora Cord and Cable Company, Aurora, Ill.
*	Garver Saw Filing Service, Alliance, Ohio
*	Jenkins Brothers, Chicago, Ill.

Note. The above three companies do not have Federal Manufacturing codes, therefore, use McConaughay Mixers, Inc. code

Section II. BASIC ISSUE ITEMS LIST

(1) Component code	(2) Federal stock No.	(3) Description	(4) Unit of issue	(5) Qty inc in unit pack	(6) Qty for in unit	(7) Qty furn with equip	(8) Qty auth	(9) Illustration	
								(A) Pic No.	(B) Item No.
		3100-BASIC ISSUE ITEMS, MANUFACTURED TURER OR DEPOT INSTALLED							
	2990-906-7920	CRANK, Hand (66289) U212A	EA		1	1	1		
	7520-559-9618	CASE, Operation and Maintenance Manuals	EA			1	1		
	7510-889-3494	BINDER, Looseleaf	EA			1	1		
	7510-244-0359	CONTAINER, PLASTIC; Logbook Binder	EA			1	1		
		DA Technical Manual; TM 5-3895-283-15	EA			1	1		
		DA Lubrication Order, LO 5-3895-283-12	EA			1	1		

Section III. MAINTENANCE AND OPERATING SUPPLIES

Component application	Federal stock number	Description	Quantity required for initial operation	Unit of issue	Qty inc in unit pack	Qty furn with equip	Qty auth	Illustration		Notes
CRANKCASE	9150-265-9435 (2) 9150-265-9428 (2) 9150-242-7603 (2)	LUBRICATING OIL: 5 gal pail as follows: OE-30 OE-10 OES	5 qt 5 qt 5 qt	(3) (3) (3)						(1) Includes quantity of oil to fill engine oil system as follows: 4—qt crankcase 1—qt oil filter
CLUTCH HOUSING AIR CLEANER		LUBRICATING OIL: (4) LUBRICATING OIL: (4)	1 qt	(3)						(2) Sec C9100-II for additional data and requisition
FUEL TANK	9130-161-1818	FUEL GASOLINE: Bulk as follows Automotive, combat 91A	17 (5)	14.4 (6)						(3) Sec current LO for grade application and replenishment intervals (4) Use oil as prescribed in item 1 above
BRAKE MASTER CYLINDER	9150-252-6375	HYDRAULIC FLUID: 1 gal can as follows: HBA	¾ qt	(3)						(5) Tank capacity
FUEL TANK	9140-286-5294	FUEL OIL, DIESEL Bulk as follows: DF-2 Grease Automotive and artillery: 5 lb can as follows: GAA GH	60 gal 5 lb 5 lb	(7) (3) (3)						(6) Average fuel consumption is 1.8 gal per hour of continuous operation. (7) Maximum fuel consumption for both burners is 12 gal per hour of continuous operation

APPENDIX C

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

C-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions, explanatory notes and/or illustrations required for a particular maintenance function.

C-2. Explanation of Columns in Section II

a. *Group Number. Column (1).* The functional group is a numerical group set up on a functional basis. The applicable functional grouping indexes (obtained from TB 750-93-1, Functional Grouping Codes) are listed on the MAC in the appropriate numerical sequence. These indexes are normally set up in accordance with their function and proximity to each other.

b. *Functional Group. Column (2).* This column contains a brief description of the components of each functional group.

c. *Maintenance Functions. Column (3).* This column lists the various maintenance functions (A through K) and indicates the lowest maintenance category authorized to perform these functions. The symbol designations for the various maintenance categories are as follows:

C—Operator or crew

O—Organizational maintenance

H—General support maintenance

D—Depot maintenance

The maintenance functions are defined as follows:

- A—INSPECT. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.
- B—TEST. To verify serviceability and to detect electrical or mechanical failure by use of test equipment.
- C—SERVICE. To clean, to preserve, to charge, to paint and to add fuel, lubricants, cooling agents and air.
- D—ADJUST. To rectify to the extent necessary to bring into proper operating range.
- E—ALIGN. To adjust specified variable elements of an item to bring to optimum performance.
- F—CALIBRATE. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.
- G—INSTALL. To set up for use in an operational environment such as an emplacement, site or vehicle.
- H—REPLACE. To replace unserviceable items with serviceable assemblies, subassemblies or parts.
- I—REPAIR. To restore an item to serviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting and strengthening.
- J—OVERHAUL. To restore an item to a completely serviceable condition as prescribed by maintenance serviceability standards using the Inspect and Repair Only as Necessary (IROAN) technique.
- K—REBUILD. To restore an item to a standard as nearly possible to original or new condition in appearance, performance and life expectancy. This is accomplished through complete disassembly of the item, inspection of all parts or com-

ufacturing tolerances and specifications and subsequent reassembly of the item.

d. *Tools and Equipment. Column (4).* This column is provided for referencing by code the special tools and test equipment, (sec. III) required to perform the maintenance functions (sec. II).

e. *Remarks. Column (5).* This column is provided for referencing by code the remarks (sec. IV) pertinent to the maintenance functions.

C-3. Explanation of Columns in Section III

a. *Reference Code.* This column consists of a number and a letter separated by a dash. The number references the T&TE requirements column on the MAC. The letter represents the specific maintenance function the item is to be used with. The letter is representative of columns A through K on the MAC.

the lowest level of maintenance authorized to use the special tool or test equipment.

c. *Nomenclature.* This column lists the name or identification of the tool or test equipment.

d. *Tool Number.* This column lists the manufacturer's code and part number or Federal Stock Number of tools and test equipment.

C-4. Explanation of Columns in Section IV

a. *Reference Code.* This column consists of two letters separated by a dash, both of which are references to Section II. The first letter references column 5 and the second letter references a maintenance function, column 3, A through K.

b. *Remarks.* This column lists information pertinent to the maintenance function being performed, as indicated on the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Functional group	(8) Maintenance functions											(4) Tools and equipment	(5) Remarks
		A	B	C	D	E	F	G	H	I	J	K		
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild		
01	Engine Ay													
0100	Engine ay, gas air cooled	O	O	O					O	F	H			A
0101	Crankcase, block								O					
	Head, cyl								O	O				
0102	Crankshaft, Ay								O	H				B
	bearings, seals								H					
0103	Flywheel ay													
	Flywheel								O	F				
	Ring gear									F				
0104	Pistons, connecting rods													
	Pistons, rings, pins									H				
	rods, connecting								H	H				
0105	Valves													
	Valves, inserts								F					C
	springs, guides, locks								F					
	Rocker arms, tappets				O				H					
	Camshafts													
	Camshaft bearings								H					
	Plunger springs								F					
	Timing gears, covers													
0106	Engine lubricating system													
	Pump, oil								F	F				
	Filters, oil													
	filter			O					O					